

*General Practice Series*

## ANAESTHESIA AND ANALGESIA IN OBSTETRICS

A. M. MICHAEL, M.B., CH.B., F.R.C.S. (ENG.), M.R.C.O.G., M.M.S.A.

Senior Lecturer in Obstetrics and Gynaecology, University of Cape Town and Cape Provincial Administration

'I will greatly multiply thy sorrow and thy conception; in sorrow thou shalt bring forth children.' *Genesis* 3, xvi.

'And the Lord God caused a deep sleep to fall upon Adam, and he slept; and He took one of his ribs, and closed up the flesh instead thereof.' *Genesis* 2, xxi.

The combination of general medication and intermittent inhalation analgesia is effective for the relief of pain and is suitable for all types of labour. Relief from pain, however, is best obtained by careful antenatal preparation, by sympathetic supervision during labour, by the judicious use of analgesic drugs (such as pethidine), and by inhalation of a mixture that provides analgesia within a short space of time. Success depends largely on the quality of the psychological management. The mother will be satisfied only if she appreciates the rationale of the method—that she will be aware of the uterine contractions and will feel the baby delivered, but will not feel undue pain.

The onset of labour gives rise to various emotions, particularly with the first born. The patient is glad that the long waiting period is over and is pleased that labour has begun as she is eagerly looking forward to seeing her infant. Her emotions are pleasurable, but they are sometimes counterbalanced by emotions of the opposite type. She may be apprehensive about the process of labour and its possible outcome and, if the thought of the actual birth perturbs her, such a state of uncertainty and anxiety culminates in fear. The average primigravida, in these 'civilized' days, is unfortunately encouraged in her fear of 'an unknown experience' by the careless use of the word 'pains' by those surrounding her, whereas means are in existence to eliminate the pain without markedly affecting the uterine contractions or being unduly harmful to the unborn child.

It is the right of women to demand relief from the pain of childbirth, and it is the responsibility of the attendant to furnish a safe conduct of pregnancy. Pain not only causes great suffering and distress, it leads to physical and emotional exhaustion so that the patient's confidence is undermined and her courage disappears. In such a state her pain threshold is lowered and moderate pain becomes increasingly unbearable. Women vary in their ability to stand pain and the sensitive or highly strung woman may interpret discomfort as pain.

*Historical*

Though many attempts were made to mitigate the ordeal of labour before the time of James Young Simpson, it is to him that credit is due for introducing anaesthesia into obstetrics. Simpson obtained and used ether for an obstetric operation for the first time in Edinburgh just a month after its introduction to England from America in December 1846. In November 1847 chloroform was also first used by him to induce anaesthesia, the drug having been sent to him for trial by Waldie—a Liverpool chemist.

Since the introduction of chloroform, which soon replaced ether in obstetrics, many drugs have been tried and all have been found to some extent wanting, so that the perfect obstetric analgesic or anaesthetic agent has yet to be discovered.

The aim of this paper is not to review all the available agents which are now in use but merely to discuss those drugs which are the most popular and, therefore, the safest.

*Qualities of the Ideal Analgesic*

Sturrock<sup>1</sup> enumerated certain minimal qualities that should be possessed by the ideal analgesic for use in obstetrics:

1. It must not endanger the life of mother or child, or in any other way harm them.
2. It must abolish or diminish pain and the memory of suffering for long periods.
3. It must not diminish uterine contractions and thereby delay labour, or predispose to atonic postpartum haemorrhage.
4. It must not prevent the patient from cooperating intelligently with the attendant, especially during the second stage of labour.
5. There should be no necessity for operative delivery solely on account of the method used to alleviate pain.
6. It should be simple to use.

*Classification of Methods for Relief of Pain in Obstetrics*

A. Analgesic agents can be classified as follows:

1. Sedatives, e.g. bromides and chloral.
2. Hypnotics, e.g. barbiturates and paraldehyde. These drugs do not have a truly analgesic action.
3. Narcotics, e.g. the opiates, morphine and pethidine.
4. Inhalant analgesics, e.g. nitrous oxide, trichloroethylene, chloroform, and ether.

B. Anaesthetic agents can be classified as follows:

(1) Local, (2) regional, and (3) general. General anaesthetic agents can be further subdivided under the following headings:

- |                             |   |          |  |
|-----------------------------|---|----------|--|
| (i) Inhalational            | { | Volatile | { Chloroform.<br>Ether.<br>Ethylchloride.<br>Nitrous Oxide.<br>Ethylene. |
|                             |   | Gaseous  | { Cyclopropane.  |
| (ii) Intravenous.           |   |          |  |
| (iii) Rectal, e.g. Avertin. |   |          |  |

C. *Suggestion* is another method for relief of pain, and its uses can be classified as follows:

- (1) Relaxation and education, and (2) hypnosis.

#### ANALGESICS

##### 1. Sedatives

These are drugs which have a quieting effect on the parturient. They lessen excitement or functional activity and make the patient receptive to sleep.

(i) *The bromides* are time-honoured drugs for the early stages of labour. They lessen the activity of the entire nervous system and decrease nervousness and emotional excitability. It is doubtful, however, whether a single dose has any real value. The taste of bromides is most unpleasant and may cause vomiting. In combination with chloral, bromides are particularly useful for excitable and apprehensive women, especially primiparae at the onset of labour. *Dose*: 15-30 gr.

(ii) *Chloral hydrate* is a sedative and hypnotic. Its main action is to soothe and calm the patient and make her receptive to sleep. This latter action appears to be most effective in the early part of the first stage of labour. As with the bromides, one of the main disadvantages of chloral is that it has an irritant action on the gastric mucosa, causing nausea and vomiting. *Dose*: 15-30 gr.

It is important to remember that neither of these two drugs is a true reliever of pain and should therefore not be given when the patient is obviously experiencing severe pain during labour.

A useful mixture which can be prescribed early in labour, especially in primigravidae, before any effective dilatation of the cervix, is the well-known mixture: Three 15's:

Rx. Chloral hydrate 15 gr.  
Potassium bromide 15 gr.  
Tinct. opii 15 min.  
Aq. chlorof. ad 1 fl. oz.

##### 2. Hypnotics

These are sleep-producing drugs. The most important ones used in obstetrics are:

(i) *Barbiturates*. A large number of drugs are included under this heading and they are all derived from barbituric acid. Their effect is variable and in some instances extreme restlessness and excitability in the presence of pain are exhibited. The length of action of these drugs varies greatly and they may be used as follows:

(a) For short action—quinal barbitone and seconal sodium.

(b) For moderate duration—pentobarbitone sodium (sodium amytal).

(c) For long action—phenobarbitone.

These drugs have little power to raise the pain threshold if administered in the usual doses. Extensive use of barbi-

turates is therefore not ideal if the cooperation of the patient is needed. In normal doses they are productive of sleep and a certain degree of amnesia. It should be remembered that the barbiturates pass the placental barrier and will cause respiratory depression in infants—especially in premature infants. Moreover, if heavy doses are employed, especially late in labour, a prolonged second stage of labour can be expected owing to failure on the part of the patient to co-operate. This often results in ineffective expulsive powers and exhaustion of the mother and may lead to an increased incidence of forceps delivery.

To summarize, therefore, it is advisable to use only the short-acting barbiturates, e.g. seconal sodium 1½-3 gr. early in labour. This will usually keep the patient comfortable until the time when uterine contractions become more disturbing. At that stage the barbiturate can be followed by an analgesic of greater potency, e.g. a narcotic.

(ii) *Paraldehyde* is a hypnotic drug and is probably the most popular analgesic in obstetrics which can be administered per rectum. It is a clear liquid with a distinctive pungent odour. Its action on the central nervous system is similar to that of avertin, but it causes less depression of the respiratory system. The ordinary hypnotic dose of 4-5 c.c., which is given by deep intramuscular injection, induces sleep 10-15 minutes sooner than any other sedative or hypnotic drug. A state of hyperexcitability occurs in some patients, especially when a small dose has been given. The dose for rectal administration is usually based on the proportion of 60 minims per stone of body weight, with a maximum dose of 1 fl. oz. It is injected slowly with 1-1½ oz. of warm saline.

A high proportion of the drug is broken down in the body and the remainder is excreted by the lungs and kidneys. These dosages usually keep the patient drowsy for 3-4 hours. Paraldehyde should be fresh and all old stocks should be discarded because it deteriorates.

##### 3. Narcotics

These are pain-relieving drugs and produce sleep. In 1680 Sydenham wrote: 'Among the remedies which it has pleased Almighty God to give to man to relieve his suffering, none is so universal and so efficacious as opium'. This appraisal is still true today.

(i) *Opium* is obtained from the milky exudate of incised unripe seed capsules of the poppy plant and, from the powdered opium, the active alkaloids—morphine, heroin, dilaudid and codeine—are obtained. These depress the perceptive and sensory areas and relieve pain by elevation of the pain threshold. Moreover, there is an alteration in the reaction to pain; fear and anxiety are replaced by contentment, relaxation and apathy, and finally a lethargic state and sleep is induced<sup>2</sup>.

Since opiates are commonly used during labour and especially in cases of incoordinate uterine action, pre-eclampsia and eclampsia, attention should be drawn to the fact that these drugs cross the placental barrier. Should delivery occur during the period of the effect of the drug, which may last from 3-6 hours, there is the possibility of serious respiratory depression in the infant. N-allylnormorphine is an antagonist of respiratory and circulatory depression caused by narcotics, and injection of 0.1 to 0.25 mg. into the umbilical vein of a new-born infant, depressed by an opiate, will usually result in prompt improvement of both respiration and circulation.

Amphenazole was introduced recently. This drug, given to the mother in 30 mg. doses, intramuscularly, reduces the respiratory depressant effect of morphine on the foetus without greatly reducing its analgesic action on the mother. With this new drug available it would seem that morphine could now be used much more freely in hospital obstetric practice than formerly.

Finally, mention must be made of morphine-scopolamine administration in the production of 'twilight sleep'. This method of analgesia has lost its vogue, owing to high incidence of excitement in mothers, and asphyxia in the new-born baby.

(ii) *Pethidine* is a synthetic drug and has a formula similar to that of atropine. Its actions are analgesic and sedative, its potency approaches that of morphine and it is an antispasmodic since it is capable of relaxing unstriated muscle tissue. *Pethidine* has proved to be an invaluable addition to the accoucheur's armamentarium, though it must be remembered that since it is a narcotic drug and there is placental transmission, it can cause respiratory depression in the infant. Large doses of *pethidine* may, therefore, cause asphyxia neonatorum, though to a lesser extent than morphine. N-allylnormorphine can be used as an antidote if necessary.

Ideally, *pethidine* should be given by intramuscular injection when labour is well established, i.e. when the cervix is at least 2 fingers dilated. The dose of 100 mg. may be repeated 2-4 hours later. In certain patients this drug may cause occasional 'shock-like' reactions with pallor, sweating, nausea, vomiting and hypotension.

Occasionally *pethidine*, given intravenously, is indicated in cases where premature bearing-down efforts are made before full dilatation of the cervix. *Pethidine* may also be given with scopolamine, 1/150 gr., or with a barbiturate.

Recently *pethilofan*—a proprietary drug—containing *pethidine*, and an antagonist, *levallorphan tartrate*, has been marketed and should prove to be ideal for the parturient and baby. It has been shown that *levallorphan tartrate* prevents or reduces the respiratory depression caused by *pethidine*. When *pethidine* and 'Lorfan'—the trade name—are combined in the ratio of 100 : 1.25, the respiratory-depressant effect of *pethidine* is inhibited whilst the analgesic action is unaffected.

It must always be borne in mind that the narcotics are habit-forming drugs.

#### 4. Inhalational Analgesia

(i) *Nitrous oxide* is a colourless gas with a sweetish smell. It is one and a half times heavier than air and is non-explosive. This gas is excreted chiefly by the lungs within 2 minutes of inhalation, therefore, it follows that the action of the gas is transitory and accumulation in the tissues is not likely to occur with intermittent administration.

(ii) *Nitrous oxide and air analgesia* in obstetrics was first employed by Minnitt in Liverpool in 1933. He adapted an apparatus so that nitrous oxide gas with 50% air could be administered to produce analgesia without loss of consciousness during labour. Various types of machines have been devised for this purpose, including portable models. Nitrous oxide is stored under pressure in cylinders and passes through a reducing valve where the pressure is brought down to a level safe for inhalation. Only during inspiration

does the gas flow and at the same time become mixed with air. It should, however, be appreciated that while using this apparatus, the parturient is getting less oxygen than if only air were inhaled. There is thus, under certain circumstances during labour, the risk that the foetus may develop anoxia. Gas and air analgesia is therefore contra-indicated in conditions under which there is the possibility of the foetus or mother being or becoming anoxic, viz.:

1. Placental insufficiency—in pre-eclampsia, essential hypertension, chronic nephritis, postmaturity and prematurity.
2. Foetal distress—as demonstrated by an irregular foetal heart, poor heart sounds and meconium staining of the liquor amnii.
3. Maternal conditions which may predispose to foetal anoxia—cardiac disease, anaemia, pulmonary disease and diabetes.

(iii) *Trichloro-ethylene (B.P.C.) (Trilene)* is a colourless liquid, though it is coloured with waxoline blue to distinguish it from chloroform and the crude drug trichlorethylene which is used in the dry-cleaning trade.

In low concentration of 0.35-0.65% it is used as an analgesic and it does not then act as a respiratory irritant. Excretion is rather slow and it is much less toxic to the liver and kidneys than chloroform. It is furthermore much less likely to cause primary cardiac failure.

Because the concentration of the vapour increases if the container is shaken, if the temperature of the room is high, or if the tidal air is increased, special thermostatically controlled machines have been designed. One of the earlier and most popular auto-inhalers is Freedman's,<sup>3</sup> a 'draw-over' apparatus which delivers a vapour concentration of 0.65% *trilene* in air. A hole near the face-piece must be covered by the patient's finger before the *trilene* vapour can be inhaled, this acting as a safety device. This method is so convenient and reliable that an investigation was instituted by a committee of the Royal College of Obstetricians and Gynaecologists to see whether it could be used in Great Britain by unsupervised midwives. A study of 2,354 cases showed that the technique was most efficient, only 7% of the mothers being dissatisfied with the relief obtained. There was no evidence of increased risk to mother and child in normal cases. Midwives in Britain are only allowed to use an apparatus approved of by the Central Midwives Board. In South Africa midwives are, as yet, not allowed to administer *trilene*.

The advantages of trichloro-ethylene as an inhalational analgesic are that:

- (1) It is pleasant to inhale.
- (2) It does not irritate the respiratory tract.
- (3) It acts more quickly than nitrous oxide.
- (4) Its analgesic and amnesic effect is greater than that of nitrous oxide.
- (5) Uterine activity is not affected.

Contra-indications to the use of this drug are the same as in the administration of nitrous oxide and air.

(iv) *Chloroform* has been used for many years and, though it is pleasant to take, acts quickly, and is cheap and portable, it is far from fool-proof. It may cause ventricular fibrillation and central necrosis of the liver lobules. Its use is therefore contra-indicated in cases with known liver disease,



pre-eclampsia and eclampsia. Its use should be restricted to producing analgesia during the actual delivery of the baby's head and, since it tends to diminish uterine contractions, it should be used as a temporary measure only, until the danger is overcome, in cases of uterine tetany or threatened rupture of the uterus in obstructed labour.

(v) *Ether* is of value in operative procedures which require anaesthesia rather than analgesia. For purposes of analgesia it is not of much value because it has a long induction period, often causing pronounced excitement in the mother and anoxia in the foetus, and also uterine relaxation.

Administration of all inhalational analgesics, to be successful, should be commenced before the patient experiences the pain associated with the contraction, since it takes 20-45 seconds to obtain maximum relief. The use of this type of analgesia should be confined to the end of the first stage, to the second stage of labour and to the actual delivery of the infant. Finally, patients should be instructed in the use of the apparatus during the ante-natal period and they should be shown how to relax and be proficient in using the face mask.

#### ANAESTHESIA

##### 1. Local Anaesthesia

This is by far the safest of all forms of anaesthesia and analgesia. It has all the advantages of other types of anaesthesia without any of the disadvantages.

##### *Advantages of Local Anaesthesia*

The advantages of local anaesthesia include the following:

- (a) Minimal anaesthetic mortality.
- (b) No pulmonary complications. The majority of obstetrical patients are not prepared for a general anaesthetic, especially when an anaesthetic is required, as is so often the case in an emergency procedure late in labour. These patients have been fed during the long hours of their travail and in addition there is the 'greatly increased physiological' delay in the emptying time of the stomach. Vomiting, aspiration, pneumonia, and laryngospasm during induction are common complications.
- (c) No foetal asphyxia.
- (d) No interference with the efficiency of the uterine contractions.
- (e) Less post-operative shock.

Admittedly, there are a few disadvantages to local anaesthesia, e.g. in highly emotional patients who will not tolerate this form of anaesthesia or where the surgeon is unacquainted with the technique of infiltration of the drug; but they are so far outweighed by the advantages that for all practical purposes they can be ruled out.

##### *Indications for Local Anaesthesia*

It has been satisfactorily demonstrated that all (major as well as minor) obstetrical procedures, with the possible exception of internal version, can be performed under local anaesthesia either by the abdominal or vaginal routes. An absolute indication for local anaesthesia may be found in patients with respiratory tract lesions (though with use of the relaxant drugs today this indication is not necessarily a rigid one), and cardiac disease. Relative indications are pre-eclampsia, chronic nephritis and cases of foetal asphyxia requiring operative deliveries especially *via* the vaginal route. Pudendal block is especially efficacious for forceps delivery,

even where a manual rotation of the head is required as in the case of a deep transverse arrest, and in breech deliveries.

##### *Anatomy of the Pudendal Nerve*

A consideration of the nerve distribution shows that the principal innervation to the lower part of the vagina and to the perineum is the sacral plexus, whose main terminal branch is the pudendal nerve. It arises in the pelvis from S.2, S.3 and S.4 and then leaves the pelvis *via* the greater sacro-sciatic foramen, crosses the dorsal surface of the ischial spine in company with the internal pudendal vessels, and re-enters the pelvis through the lesser sacro-sciatic foramen. Thereafter, accompanied by the internal pudendal vessels it enters Alcock's (pudendal) canal. Immediately before entering the canal, it gives off the inferior haemorrhoidal nerve which traverses the ischio-rectal fossa to the anus. Shortly before leaving the canal the pudendal nerve divides into its terminal branches, the clitoral and perineal nerves, which respectively supply the skin surrounding the upper two-thirds of the vulva and the lower third of vulval region, perineum and the area round the anus.

##### *Technique of Pudendal Nerve Infiltration*

Using a 0.5 or 1% lignocaine solution, 2 cutaneous weals are made, one on either side of the midline, at points halfway between the fourchette and the ischial tuberosities. Using 12 cm. needles, subcutaneous weals are extended anteriorly towards the clitoris on both sides, as well as posteriorly to the region of the tip of the coccyx. A diamond-shaped superficial area is thus anaesthetized. The index finger is now inserted into the vagina and placed on one or other ischial spine. The needle is now pushed through the skin at the site of the original weal, until it is in the region of the tip of the finger palpating the ischial spine and 5-10 ml. of the anaesthetic agent is injected. The procedure is now repeated on the opposite side. Finally 5-10 ml. of the solution may be injected medial to the inner aspects of the ischial tuberosities.

An important point to remember when employing pudendal nerve block for breech deliveries is that the nerve should not be infiltrated until such time as the buttocks of the baby are visible and the perineum is well distended. After efficient infiltration, the patient no longer has the urge to bear down with the contractions and she should therefore be encouraged by the attendant to employ her secondary or voluntary expulsive powers when a uterine contraction is palpable.

##### 2. Regional Anaesthesia

The following methods of regional anaesthesia are employed: (i) Epidural caudal anaesthesia and epidural lumbar anaesthesia; (ii) Spinal anaesthesia.

##### (i) Epidural Anaesthesia

Caudal anaesthesia can be divided into continuous anaesthesia, and terminal or single injection. Either type is safe and successful only if given by a doctor with adequate experience and training in the technique. Most experience to date has shown that continuous caudal anaesthesia is successful only if a 24-hour anaesthesia service with trained staff is available.

The advantages of caudal anaesthesia are the same as those for local anaesthesia, but the disadvantages are somewhat greater. The technique is more difficult. There are the dangers of injecting the solution into the spinal canal, of



circulatory and respiratory collapse, and of prolongation of the second stage of labour. This is common and leads to a consequent increase in forceps rate as well as to failure of rotation of the foetal head—with a resultant high rate of occipito-posterior presentation. Puerperal urinary retention may also be encountered.

*Technique of administration of the solution.* A solution of 1.5% metycaine, xylocaine or procaine is generally employed and 8 ml. is injected through the sacral hiatus into the extradural space. After an interval of 10-15 minutes, during which time it is ascertained (by asking the patient to move her toes) whether the solution has not been injected intradurally, a further 20-30 ml. is slowly injected. This dose is sufficient for the low type of caudal anaesthesia and, in cases on continuous caudal anaesthesia, the needle or catheter is left *in situ* and subsequent injections of 10-20 ml. are made every 2-3 hours or as necessary.

Lumbar anaesthesia has also been used and the solution, injected between the 3rd and 4th lumbar spines, diffuses through the intervertebral foramina along the perineural nerve sheaths, blocking the nerve routes.

#### (ii) Spinal or Spinal Saddle Block Anaesthesia

This type of anaesthesia has its advocates but the disadvantages and dangers are so numerous that its use in labour (especially in cases of vaginal delivery) should probably be condemned.

### 3. General Anaesthesia

The administration of general anaesthesia to patients in labour is associated with a definite mortality, the mechanism of which is usually the inhalation of stomach contents into the bronchial tree. Mendelsohn<sup>4</sup> described a syndrome resulting from aspiration of acid gastric contents which may not show itself for several hours after the occurrence of the accident. Then the onset of the illness is dramatic and the patient becomes extremely ill, exhibiting cyanosis, dyspnoea and tachycardia. She will also show signs of pulmonary oedema with patchy consolidation at the lung bases.

Lock and Greiss,<sup>5</sup> on analysing a series of 900,000 live births, found that 45 deaths were stated to be directly due to anaesthesia and, of these, 30% were ascribed to inhalation of vomitus and 25% to spinal analgesia.

Where general anaesthesia has to be employed during labour, aspiration of the stomach contents pre-operatively by means of gastric tube and intubation of a cuffed endotracheal tube are essential. In addition to this it is of prime importance to have an efficient suction machine readily available.

#### Caesarean Section

It is not the purpose of this paper to discuss anaesthetic procedures for major obstetrical operations, but it is felt that mention should be made of the type of anaesthesia advised for Caesarean sections. There is no surgical procedure where careful selection of the anaesthetic used is more important than in Caesarean section. This is especially true since the child *in utero*, as well as the mother, has to be taken into consideration. Because of the depressive action of the anaesthetic agent on the respiratory mechanism, many infants fail to survive the first few hours of life. Prolonged anaesthesia preceding actual delivery has, therefore, a deleterious effect on the unborn child. This statement has recently been questioned and there is evidence to show<sup>6</sup> that it may not necessarily be true.

Various methods of anaesthesia for Caesarean section are practised and advised, ranging from local infiltration, continuous or fractional spinal anaesthesia, continuous caudal anaesthesia and intravenous and general anaesthesia. With the advent of the muscle-relaxant drugs, a technique of anaesthesia for Caesarean section, which has been favourably received, has been evolved. This consists of preparing the patient for the operation, cleaning the abdomen, draping the patient and when 'everything and everyone is ready', 250-500 mg. pentothal is given intravenously, followed by the appropriate muscle-relaxant drug. The patient is then immediately intubated with a cuffed endotracheal tube, oxygenated, and the operation commenced. With this method the baby can be extracted with the minimum delay and usually in good condition. The anaesthetic agent to be used after delivery of the infant can be left to the discretion of the anaesthetist.

#### SUGGESTION

##### *Relaxation and Education*

Parturition, being a physiological function of the female should, theoretically, be a painless procedure. Very few women, however, have 'painless childbirth' in the true sense of the meaning.

Grantley Dick Read has evolved the theory that fear causes a sympatheticotonia which makes the circular fibres of the cervical sphincteric muscles contract. This in turn causes a disturbance of the polarity of the uterus, resulting in increased tension of the muscles of the upper uterine segment to overcome this obstacle and eventually the threshold of pain is crossed. Read sums up the situation admirably with the phrase: 'A tense mind means a tense cervix and a long painful labour'. There is no doubt that adequate antenatal preparation by abolishing ignorance, fear (which is usually the result of ignorance), and apprehension, combined with suggestion and training in relaxation, do work wonders with a cooperative patient during labour.

There is convincing evidence to show that the duration of the first stage of labour is shortened and that a relatively painless childbirth can be attained by patients receiving this training. Much can be done by educating pregnant (and non-pregnant) women that child-bearing is a physiological function of the body and it is suggested that those in charge of antenatal clinics institute a series of lectures on the physiology and hygiene of pregnancy, labour and the puerperium, to be given to large groups of women awaiting their turn to be examined during the antenatal visits. This would help to dispel the fear of the unknown which awaits women on entering the labour wards of our institutions and rid them of their belief that pain is a necessary adjunct of a normal labour.

##### *Hypnosis*

In recent years considerable interest has been aroused in hypnosis with special reference to its application in the relief of pain during childbirth. Unfortunately the attitude of the general public and some medical practitioners towards hypnosis has been, and too often still is, one of superstition, fear, and even open hostility. Only on rare occasions, however, have attempts been made to assess the value of hypnosis as an 'analgesic or anaesthetic agent' in labour.

There is no doubt that prenatal training in hypnosis can benefit the parturient woman by assuring relaxation and, to

a certain extent, abolishing the painful contractions of parturition; there is also evidence that the duration of labour is shortened.<sup>7,8</sup> Read's technique depends on the use of education, relaxation and suggestion, and by employing trance states one only carries his method a stage further.

#### CONCLUSIONS

1. Antenatal preparation of the expectant mother, with special reference to education, removal of fear and ignorance, relaxation and instruction in the use of various analgesic apparatus, is essential.

2. Early in labour a mild sedative or hypnotic is all that is required.

3. When labour is firmly established a narcotic—usually pethidine or pethilorfan—is indicated. Where labour is

expected to be somewhat prolonged, morphine is the narcotic of choice.

4. Inhalational analgesia is the method of choice for relief of pain late in the first stage and during the second stage of labour.

5. Employment of local and pudendal nerve infiltration is recommended for the majority of forceps deliveries as well as all breech deliveries.

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### CIRRHOSIS OF THE LIVER IN THE THREE ETHNIC GROUPS IN CAPE TOWN\*

J. G. THOMSON, M.D., *Department of Pathology, University of Cape Town*

Much of the scanty information on the frequency and types of cirrhosis of the liver in Africans is of restricted value in the absence of uniform grounds for its diagnosis and classification. Furthermore, the material is often selected, and mainly concerns the young Bantu male with primary carcinoma in addition to his cirrhosis. A project has been initiated by the African Cancer Committee of the International Union against Cancer to obtain comparable information on cirrhosis and primary cancer from different centres in Africa south of the Sahara, using the strict criteria and histological classification of Steiner and Higginson. This preliminary report is part of that project.

In the records of the Department of Pathology of the University of Cape Town, over the 10-year period 1948-1957, 121 cases of cirrhosis were found in 5,500 autopsies. This included a large number of infants, mainly Coloured and African, and the frequency figures are based on subjects over the age of 10 years (total 3,150). This autopsy material from the main teaching hospitals of the University of Cape Town, is representative of the 3 racial groups, except that no autopsies are carried out on the Moslem section of the Coloured community (Cape Malays).

#### Results

The incidence of cirrhosis in autopsies over the age of 10 was 5.2% in Europeans, 1.66% in Coloured and 6.4% in Africans. In all groups more males than females were examined at autopsy, and the corrected figures for the sexes are, males: Europeans 6.2%, Coloured 2.68%, and Africans 8.3%; and females: Europeans 3.8%, Coloured 0.66%, and Africans 2.3%. The figures for Africans are based on small numbers but are similar to those based on larger numbers from Johannesburg. The figures for Europeans are similar to those of other countries of European stock, with perhaps a rather higher figure for females. The incidence of cirrhosis in the Coloured is low in males and very low in females.

In all 3 groups the frequency of the histological types was very similar, with post-necrotic and portal types accounting for the majority. Types with fat were less frequent in the Coloured than in Europeans, and rarest in Africans. This relative uniformity of morphological types is not regarded as indicating uniform aetiological factors.

\* Abstract of a paper presented at Research Forum, University of Cape Town, 21 April 1959.

The age at death ranged from 55 in Europeans, 45 in Coloured to 37 in Africans. In the Europeans and Coloured the cirrhosis was in most cases the cause of death—the patients were admitted in coma of with ruptured oesophageal varices. In the Africans just over one-half died from an associated primary liver carcinoma; in most cases signs and symptoms were terminal only, and were probably due to the cancer. In the remainder the cirrhosis was usually an incidental finding at autopsy, where death was due to other causes. Associated primary cancer of the liver was found mainly in males, and in this series the frequency of primary cancer in cirrhosis in males was: Europeans 3.7%, Coloured 5.5% and Africans 57.9%.

Alcoholism was mentioned in the clinical notes in just over 50% of the Europeans and Coloured, but its true incidence is probably much higher, since a history was not obtained from some of the patients in coma. In Africans a history of having taken alcohol was elicited in only 9% of cases.

#### Conclusions

In European and Coloured in Cape Town the incidence of cirrhosis appears to be related to alcoholism. It is difficult to believe that dietary deficiencies unassociated with alcoholism play a significant aetiological role in these racial groups in Cape Town, since cirrhosis in European women is 6 times commoner at autopsy than in Coloured women.

In the African the connection between cirrhosis and alcoholism is much less striking. It is likely that some of the cirrhosis in the Africans in Cape Town has an aetiology similar to that in the European, since the type of alcohol that the European drinks is more readily available to Africans in this area than elsewhere in the Union. The bulk of cirrhosis in the African, here as elsewhere, differs from cirrhosis in the European in most respects except that of morphology. The most significant aspect of this difference is probably the relative infrequency of signs and symptoms of cirrhosis in the African except as a terminal phenomenon, when a primary cancer is so often present. It is suggested that in the majority of cases of cirrhosis in the African the cirrhosis and the cancer have a common aetiology, and that both diseases develop more or less simultaneously, presumably from ingested carcinogens of unknown nature.

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# South African Medical Journal : Suid-Afrikaanse Tydskrif vir Geneeskunde

EDITORIAL : VAN DIE REDAKSIE

## THE GUILLAIN-BARRÉ SYNDROME

The Guillain-Barré syndrome may be defined as 'an acute diffuse infective disease of the nervous system involving the spinal cord and peripheral nerves and occasionally the brain'. The condition has variously been called acute toxic polyneuritis, acute febrile polyneuritis, acute infective polyneuritis, and polyradiculoneuritis.<sup>1</sup> In the original paper, Guillain, Barré and Strohl laid down three criteria necessary for the diagnosis of this group of diseases, viz. (1) albuminocytological dissociation, (2) preponderance of motor weakness over sensory disturbances, this being mostly of a subjective nature, and (3) remarkably rapid and complete recovery despite the initially serious appearance. However, in 1938 Guillain dropped the rigid criteria, agreeing that the protein in the cerebrospinal fluid was not always so high, and that the disease was sometimes fatal. The relation of Landry's paralysis to this syndrome has always been debated. In 1949 Haymaker and Kernohan<sup>2</sup> concluded that the various disorders, Guillain-Barré syndrome, acute infectious polyneuritis and Landry's paralysis fell into the same syndrome, and they used the term 'Landry-Guillain-Barré syndrome'. Crozier and Ainley<sup>3</sup> would agree with this, but Brain, while admitting that the distinction between Landry's paralysis and the Guillain-Barré syndrome is somewhat indefinite, considers that, in the typical Landry's paralysis, while the motor disturbances are similar to those of the Guillain-Barré syndrome, the sensory loss is slight or absent.

The pathology of this syndrome has been well described.<sup>4-6</sup> The basic pathological process is a pronounced oedema of the nerve fibres of the spinal roots and the proximal portions of the cranial and peripheral nerves. This appearance is seen early in the disease. There is narrowing and obliteration of the perineural spaces, and in more severe cases strangulation of the radicular trunks due to the oedema. Degeneration of the myelin sheath in the peripheral nerves and central nervous system may follow. Obliteration of the perineural spaces blocks the absorption of the cerebrospinal fluid along these channels and leads to stagnation and trapping of the fluid within the subarachnoid space. This obstruction permits the absorption of fluid and electrolytes but not the larger protein molecules, the classical albuminocytologic dissociation resulting. Austin,<sup>7</sup> however, notes that simple 'stagnation' of previously elaborated protein does not alone explain the increase in protein in the cerebrospinal fluid.

Typically the Guillain-Barré syndrome develops a few

days after a mild upper-respiratory-tract infection. It may also follow upon a mild gastro-intestinal upset. The motor signs are those of bilateral, symmetrical, progressive weakness and, later, flaccid paralysis with selective involvement of the proximal parts of the limbs. The superficial and deep reflexes are either diminished or absent. Sensory disturbances may be subjective or objective. The prognosis must be guarded,<sup>8</sup> and the course is variable. The usual duration of the illness is from 3 to 6 months, but it sometimes continues for as long as three years. Recovery is usually complete, though 5-10% of cases are left with significant permanent sequelae. The mortality rate varies in different series from 20% to 42%.<sup>6,9</sup>

Numerous drugs have been used in the treatment of the condition, and it is difficult, if not impossible, to determine whether any drug favourably changes the natural course of the disease. The concept of an allergic basis in this disease prompted the use of steroid hormones, and their use was first reported in 1952.<sup>10</sup> It is stressed that ACTH and cortisone must be given at an early stage, while the oedema is still present, and not at the stage of chronic root strangulation—when the drugs will be of no value.<sup>6</sup> However, not everyone is agreed on the value of steroid therapy, and in 1953 Plum<sup>11</sup> wrote: 'Thus improvement of polyneuropathy following corticotropin or cortisone therapy appears to be but an occasional unpredictable phenomenon, possibly only of coincidental significance'.

Recurrence in the usual, untreated case of the Guillain-Barré syndrome is rare.<sup>12</sup> It is of great interest that from one-third to one-quarter of reported treated cases suffered recurrence. While there are various explanations for this, Austin suggests that the fact that recurrences do occur, and often after the withdrawal of the drugs, indicates a true drug effect which may separate a more homogeneous, responsive group from the heterogeneous Landry-Guillain-Barré syndrome.<sup>7</sup>

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## BEHANDELBAARE GEBREKE BY KINDERS

Die opkoms van die voorkomende medisyne gedurende die laaste aantal jare het daartoe gelei dat die aandaag van geneesherre sowel as van welsynsliggame en lede van die algemene publiek sterker as ooit tevore gevestig is op die be-

handelbaarheid van baie gebreke wat voorheen nie altyd doeltreffend benader is nie. Twee belangrike voorbeelde in hierdie verband is die probleem van hardhorendheid (waaroor ons elders in hierdie uitgawe 'n artikel plaas)



en versteuring van die ontwikkeling van spraak by klein kindertjies (waaroor ons 'n brief in hierdie uitgawe plaas).

Dit is ontstellend om te dink dat volgens berekening ongeveer 10% van alle mense hardhorend is—te meer so omdat die probleem van hardhorendheid, anders as dié van doofheid, veelal in die verlede verwaarloos is.

Dit word vandag al meer besef dat 'n hele reeks moeilikhede met skolasiese vordering op skool, sowel as baie vorms van wanaanpassing by kinders, toegeskryf kan word aan hardhorendheid in die een of ander graad. Aan die ander kant word dit ook besef dat geweldig baie gedoen kan word om die nadelige gevolge van hardhorendheid te voorkom. In die artikel oor die probleem van hardhorendheid wat ons plaas, word daar verwys na wat behoort gedoen te word by die bekamping van hierdie toestand. Kortliks kom dit daarop neer dat ons benadering só omvangryk moet wees dat dit al die fasette van voorkoming, behandelings, konservasie en kompensasië insluit.

Dit is die plig van ouers, onderwysers, werkgewers en gesondheidsbeamptes om toe te sien dat die probleem van hardhorendheid op 'n rasionele en daadwerklike basis aangepak word. Dit is dus nie genoeg dat daar sentrale gehoorsentrums, wat ten volle uitgerus is, aan al ons opvoedkundige inrigtings en gesondheidsdepartemente bestaan nie; ons moet ook toesien dat die aktiewe belangstelling van die samelewing as geheel opgewek en wakker gehou word.

'n Soortgelyke probleem as die van hardhorendheid, is die probleem van gebrekkige ontwikkeling van spraak by kinders. Dit gebeur byvoorbeeld glad te dikwels dat onderwysers, maatskaplike werkers en geneesherse met huiwering deur ouers genader word wat kinders het wat al redelik gevorderd is wat hul algemene ontwikkeling betref, maar wat nie wil of kan praat nie, of gebrekkig praat—en dat die saak dan met 'n skertslag en met die ophaal van die skouers afgehandel word, en met die versekering dat die kinders tog vroeër of later wel sal begin praat.

Ons wil dit beklemtoon dat die soort benadering wat ons nou net geskets het, verkeerd is. Seer sekerlik moet daar nie oorhaastig opgetree word sodat die ouers skrik en gedwing word om onnodige en duur ondersoeke te laat doen nie. Maar, aan die ander kant moet daar gesorg word om nie behandelbare spraakgebreke mis te kyk nie. Want, indien dit gedoen word, kan onnoembare skade aan die ontwikkelende ego van die kind berokken word deur die gevolge van sy tekortkoming of gebrek; byvoorbeeld, wanaanpassing en frustrasie in sy omgang met ander kinders kan ontstaan en ook vertraging van sy vordering op skool.

Die twee voorbeelde wat ons hier genoem het, is maar enkele voorbeelde uit baie meer gevalle van probleme wat soms nie as direkte mediese probleme beskou word nie, maar wat dit tog in werklikheid is. Hier, soos op soveel ander gebiede, kan die voorkomende medisyne 'n groot positiewe bydrae lewer tot die welstand en geluk van kinders sowel as van volwassenes.

## DIE GEBRUIK VAN ARGINIEN BY PASIËNTE MET HEPATIESE KOMA

J. J. D. JACOBS, M.B., Ch.B. (KAAPSTAD), M.MED. (CHIR.) (PRETORIA)

*Voltydse Chirurg, Karl Bremer-Hospitaal, Bellville, Kaap*

Die meganisme en behandeling van hepatiese koma is nog nie helder omlyn nie. Die toepassing van omleidingsprosedures vir portale hipertensie het ook die chirurgie se aandag hierop gevestig, aangesien die sindroom hom veral na dié soort ingreep kan voordoen. Massiewe gastro-intestinale bloedings is ook verder 'n oorsaak vir die toestand by pasiënte met lewerskade.

Die juiste meganisme is onseker, maar nuwere werk van McDermott *et al.*<sup>2</sup> en Eiseman *et al.*<sup>1</sup> maak baie sterk aanspraak daarop dat ammoniakvergiftiging 'n besondere belangrike rol in die sindroom van hepatiese koma speel, en dat die neuro-psigiatrisse verskynsels wat voorkom gewoonlik vergesels word van verhoogde ammoniak in die bloed van hierdie pasiënte.

Die verhoogde ammoniak in die perifere bloedstroom is grootliks afkomstig van die spysverteringskanaal waar bakterieë proteïenprodukte verwerk met die vorming van ammoniak. Waar bloeding in die spysverteringskanaal voorkom, is omstandighede meer gunstig vir die proses. Ammoniak wat so gevorm word in die spysverteringskanaal word na absorpsie deur die portale sirkulasie na die lewer vervoer, waar dit skadeloos gestel word deur die lewer en verander word na ureum.

Die afbreek van ammoniak kan tot 'n mindere mate geskied deur transaminasie-reaksies in die perifere weefsels deur die omskepping van glutamiensuur na glutamien. Detoksifikasie vind egter grootliks in die lewer plaas, en

indien die pasiënt se lewer nie daartoe in staat is om die funksie te behartig nie, kan vergiftiging plaasvind as die ammoniak by die lewer kan verbykom na die sistemiese sirkulasie.

Die term 'hepatiese koma' word gekoppel aan die ensefalopatie wat gepaard gaan met die sindroom, en Murphy *et al.*<sup>3</sup> beweer dat een van die mees konstante meegaande veranderinge 'n verhoging is van ammoniak in die perifere bloedstroom. Die kliniese beeld vorder deur 3 fases, naamlik delirium, stupor, en koma.

Massiewe bloeding vanaf esofageale spatate bevorder die ontstaan van ammoniakvergiftiging. Ook pasiënte met bloeding van enige deel van die spysverteringskanaal is blootgestel aan hierdie gevaar—nie alleen as gevolg van reeds meegaande ingekorte lewerfunksie nie, maar heel waarskynlik ook as gevolg van hepatiese ischemie wat die lewerfunksie kan inkort gedurende die tydperke wat sulke pasiënte aan hipotensie blootgestel is.

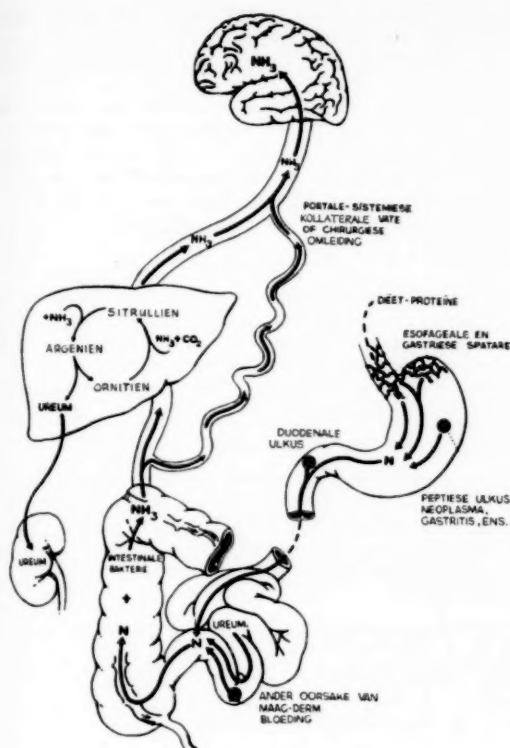
Een geval van ammoniakvergiftiging as gevolg van 'n besmette ileale blaas is ook deur McDermott<sup>4</sup> gerapporteer, en nog 'n ander geval van hepatiese koma na utero-sigmoidostomie deur Silberman.<sup>7</sup> In albei hierdie gevalle was die oortollige vorming van ammoniak te wyte aan infeksies. Hierdie 2 pasiënte het albei sirrose van die lewer gehad met ingekorte lewerfunksie en kon dus nie die oormaat ammoniak hanteer nie.

In meegaande afbeelding (Afb. 1) word die stikstofkring-

loop van massiewe stikstofstofwisseling. In toestand van aangetoë en op 'n Poggendorff te vernagte waarde ammoniak mottel van anbevoord dat die meer 'n dalk Die vo van su

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Afb. 1. Verduideliking van die stikstofkringloop.

loop verduidelik. Daarin word aangetoon hoe letsels wat massiewe bloeding veroorsaak, die gewone hoeveelheid stikstof in die spysverteringskanaal kan vermeerder. Die stofwisseling in die lewer word op die Krebs-siklus gebaseer. In toestande van lewerskade of chirurgiese omledings word aangetoon hoe ammoniak in die sistemiese sirkulasie beland en op die sentrale senuweestelsel sy invloed uitoefen.

Pogings om die vorming van ammoniak te verhoed of te verminder, of selfs te vernietig, mag dus van terapeutiese waarde wees. Glutamiensuur kan toegedien word om ammoniak deur transaminasie te bind, maar volgens McDermott *et al.*<sup>2</sup> veroorsaak dit net tydelike vermindering van ammoniak. As alternatief kan die sintese van ureum bevorder word. Werk deur Najarian *et al.*<sup>5</sup> dui daarop dat die toevoeging van arginien die lewer aanmoedig om meer ureum te vervaardig, en dat dit gepaard gaan met 'n daling in die konsentrasie van ammoniak in die bloed. Die volgende regime word dus voorgestel vir behandeling van sulke pasiënte:

1. Verhoed sover moontlik proteïen-inname by die pasiënte, en gee hulle 40% glukose deur 'n polieteenbuis in die inferior vena cava om die benodigde kalorieë te verskaf.
2. Beheer gastro-intestinale bleedings.
3. Verwyder opgehoopde bloed in die spysverteringskanaal deur uitspoeling of deur purgeermiddels.
4. Dien 'n breëband-antibiotikum per mond toe wat die omskepping van stikstofelemente verminder of vertraag in die spysverteringskanaal.
5. Toediening van arginien intraveneus, asook glutamiensuur.

Aansporing deur hierdie werk het tot behandeling gelei van 3 pasiënte volgens hierdie regime, en resultate van die behandeling word nou hier beskryf.

Toetse vir ammoniak-bloedkonsentrasie kon ongelukkig nie gedoen word nie aangesien fasiliteite nie beskikbaar was nie. Om die leser nie onnodig te belas met al die veelvuldige laboratoriumtoetse wat in die gevalle gedoen is nie, word die toetse weggelaat en volg net 'n beknopte beskrywing van die kliniese verloop van die gevalle gedurende hul hospitaalverblyf.

#### Geval 1

Mev. J.J.K., Blanke vrou, 73 jaar oud is toegelaat met kliniese en radiologiese tekens van akute diermoobstruksie. Sy is 4 jaar gelede behandel vir sirroze van die lewer met geelsug, en 6 maande gelede het sy 'n radikale mastektomie gehad vir skirreus karsinoom van die mamma. 'n Noodoperasie is uitgevoer onder epidurale narkose nadat haar vog- en elektroliet-versteurings reggestel is. By operasie is daar 'n afsluiting gevind in die gebied van die derde deel van die duodenum deur 'n infiltrerende tumor-massa. Dit was moeilik om te bepaal of die massa van die pankreas, die duodenum of die retroperitoneale gebied afkomstig was. Die pasiënt se galblaas was groot uitgeset en die lewer het 'n makroskopiese beeld getoon wat gelyk het soos uitgebreide sirroze, maar geen sekondêre karsinoom-uitsaaiings kon vasgestel word nie. Weens die toestand van die pasiënt en die obstruksie in die gebied van die ampulla van Vater, is kortsluitings gedoen tussen die galblaas en die jejunum, tussen die maag en jejunum as palliatiewe prosedures, en die buik is gesluit. Geen biopsie is geneem in die gebied van die duodenum nie omdat daar die risiko was dat die pasiënte 'n fistel mag ontwikkel.

Ten spyte van die lewerfunksietoetse wat redelik normaal voorgekom het, en 'n wisselende bloedureum van 19-30 mg.%, het die pasiënt op die derde dag 'n angstige voorkoms begin ontwikkel en deliries begin word. Na 'n verdere paar uur het sy almeer haar bewussyn verloor, en na nog 12 uur was sy in diep koma. Sy het nou ook geelsug begin ontwikkel wat klinies duidelik waarneembaar was. Behalwe 'n hoë kalorievoeding van 40% glukose wat parenteraal in die inferior vena cava toegedien is, is besluit om die uitwerking van arginien te probeer.

Op hierdie stadium is 20 g. arginien in 200 c.c. 10% dekstrose en water binnears toegedien oor 'n tydverloop van 3 uur. Na 12 uur was die pasiënt se bewussynstoestand duidelik baie beter, en is nog 'n verdere 20 g. arginien op dieselfde wyse toegedien. Na nog 24 uur was die pasiënt se geestestoestand so verbeter dat sy die verplegingstaf weer kon onderskei en sy weer kon aangaan met mondvoeding. Gedurende die tydperk wat die arginien toegedien was, het sy ook neomisien per maagbuis ontvang om die spysverteringskanaal te steriliseer.

Hierna het sy vinnig verbeter en is op die 14e postoperatiewe dag ontslaan.

#### Geval 2

Pasiënt J.H., Blanke man, 48 jaar oud, is in die Departement Interne Geneeskunde opgeneem met 'n geskiedenis van braking, opsetting van die buik gedurende die afgelope 5 weke, asook geelsug gedurende die laaste 3 maande. Die pasiënt is 9 maande tevore vir sirroze van die lewer behandel, wat gepaard gegaan het met edeem, askites en geelsug. Op die vierde dag van toelating het die pasiënt bloed begin braak in klein hoeveelhede. Op die vyfde dag het die pasiënt weer bloed in groter hoeveelhede gebrak, en 'n Sengstagen-Blakemore-buis is gepasseer en in posisie gefixeer. Teen dié tyd het die pasiënt al 6 pinte bloed gekry. Die pasiënt het nou sy bewussynstoestand begin verloor, en in die volgende 24 uur was hy in 'n diep koma met ekstensor voetsoolrefleksië.

Daar is op dié stadium besluit om hom arginien toe te dien en 20 g. arginien is in 250 c.c. 10% glukose oplossing oor 'n tydperk van 3 uur binnears gegee. Na verloop van 12 uur was daar 'n geringe toename in die helderheid van sy geestestoestand. Die toediening van arginien, 20 g., is weer herhaal op dieselfde wyse, en na nog 12 uur was sy bewussynstoestand nog beter. Na 'n derde infusie van 20 g. arginien was die pasiënt heeltemal by sy normale bewussyn. Gedurende dié tyd is die dermkanaal van die pasiënt skoongemaak van bloed deur 'n purgeermiddel wat deur die Blakemore-buis toegedien is, en het hy ook neomisien gekry vir dermsterilisasie. Na verwydering van die Blakemore-buis

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3 dae later, het die pasiënt egter skielik weer 'n massiewe bloeding gehad en is oorlede.

#### Geval 3

Blanke man S.C., 70 jaar oud, is toegelaat met geelsug (2 maande) en 'n geskiedenis en kliniese tekens van 'n infektiewe hepatitis met uitgebreide lewerskade. Die diagnose is hoë twyfel bevestig met 'n naaldbiopsie van die lewer. Die pasiënt se toestand by toelating was sleg; swak voedsel- en voginname met braking moes altyd parenteraal aangevul word. Lewerfunksietoets was onbevredigend—daar was 'n bilirubienwaarde van 28.1%. Op die vyfde dag na toelating het die pasiënt begin lomerig word en soms deurmekaar begin praat. Hierdie toestand het weer verbeter, maar op die agste dag na toelating het hy tekens begin toon van hepatiese koma met 'n 'flapping tremor' en veranderinge van bewussyn. Hy het verder verdiep in koma met ekstensor voet-soolreflekse.

Op hierdie stadium is 10 g. arginien toegedien, sonder enige verbetering. Die toestand van die pasiënt het steeds versleg, en 'n dialisering is probeer—ook sonder noembare sukses. Die daaropvolgende 4 dae het hy weer 10 g. arginien per dag ontvang, plus 40% dekstroze en tetrasiklien intraveneus, plus die nodige vitamine en vog. Meer arginien was ongelukkig nie op dié stadium verkrygbaar nie. Alhoewel hy aanvanklik 'n bietjie beter voorgekom het, is hy oorlede op die 15e dag na toelating. Aan die einde het hy hematiese gehad en 'n melena-stoelgang gepasseer.

#### KRITIESE BESPREKING

Daar is heelwat meningsverskil aangaande die waarde van arginien, en daar word op gewys dat soortgelyke resultate verkry word sonder om arginien te gebruik.

Sherlock,<sup>8</sup> wat baie gevalle van hepatiese koma behandel het, kon nie altyd bloed-ammoniakwaardes koppel met die graad van koma nie. Andere weer, Phear *et al.*<sup>6</sup>—vind dit baie moeilik om bloed-ammoniakwaardes akkuraat te bepaal, en beweer dat pasiënte met sirrose soms voordoen met bloed-ammoniakwaardes wat hoog is sonder om in koma te gaan. Hierdie argumente behoort sorgvuldig oorweeg te word. Dit is byvoorbeeld moontlik dat 'n pasiënt met sirrose 'n gestadige kollaterale bloedsomloop ontwikkel en soos die siekte progressief word, vind daar 'n mate van aanpassing van die breinweefsel plaas vir verhoogde ammoniakwaardes, anders as by pasiënte met 'n akute episode van lewerskade of oorlading van die lewer. Soortgelyke

ondervindings word by pasiënte met uremie opgedoen. Wat ook al die toksiese stowwe in die toestand mag wees, 'n hoë bloedureum kan teenwoordig wees sonder kliniese tekens.

Hoe dit ookal sy, hepatiese koma is 'n baie ernstige toestand waar iedere moontlike poging aangewend behoort te word om die herstel toe te laat, en tot tyd en wyl hierdie saak buite twyfel beslis is, het die ondervinding met die 2 pasiënte uit hierdie reeks van 3, 'n mate van vertroue in arginien as terapeutiese middel laat ontstaan.

#### OPSOMMING

Die rol wat ammoniak speel in gevalle van hepatiese koma is kortliks bespreek, en 'n skema van behandeling van pasiënte in hepatiese koma word voorgestel. Die waarde van arginien as deel van hierdie regime is genoem. Opsommings van 3 gevalle is bygevoeg waarvan 2 dramatiese veranderinge getoon het met hierdie terapie.

#### SUMMARY

The role played by ammonia in cases of hepatic coma is briefly discussed and a scheme for the treatment of patients in hepatic coma is suggested. The value of arginine as part of this regime is pointed out. Summaries of 3 cases are given, 2 of which showed dramatic changes as a result of this therapy.

Ek wil graag my dank uitspreek teenoor prof. F. D. du T. van Zijl, Hoof van die Departement Chirurgie, en dr. R. L. M. Kotzé, Superintendant van die Karl Bremer-Hospitaal, vir toestemming om hierdie gevalle te publiseer. Ook wil ek prof. A. J. Brink bedank vir die toestemming tot publikasie van 2 van die gevalle wat in die Departement Interne Geneeskunde was.

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## PSYCHOTHERAPY IN DIABETES

A. SLOME, B.A., M.B., Ch.B., and C. A. LUCKHOFF, M.D., Cape Town

The following is the case history of a diabetic man who failed to improve on insulin and other routine therapy, yet became clinically well and lost his glycosuria after psychotherapy.

#### CASE REPORT

W, aged 54 years, was first seen in December 1951, complaining of a productive cough following pneumonia 2 months previously. Earlier during the same year he had suffered from acute suppurative appendicitis and a septic foot. In childhood he had had one attack of osteomyelitis.

He was found to be a somewhat over-weight, ruddy-complexioned man of average health, except for chronic bronchitis and persistent glycosuria, the urine sugar averaging 2%. The fasting blood sugar was found to be 242 mg. %. The cardiovascular system was normal except for a hypertensive tendency, the highest reading over the course of several years being 165/98 mm. Hg.

He was put on an adequate diet and 20 units of protamine zinc insulin daily. At a later stage this was increased to 40 units a day. He remained on this therapy for nearly 6 years and during this

period the glycosuria persisted at the same level and the fasting blood sugar varied between 240 and 280 mg. %, in spite of treatment at one stage being supplemented with Invenol and also with Diabuton. There was at no time acetonuria or albuminuria. The weight remained approximately constant during the whole of this period.

In September 1957 his general health began to deteriorate and he suffered from depression, anxiety and mild confusion. He was again investigated clinically and no change from the previous status could be found. The glycosuria was unchanged and the fasting blood sugar was 234 mg. %. As the case was now developing into one where ordinary physical measures were obviously inadequate, W was referred for evaluation and treatment of his mental and emotional attributes. The results of these investigations follow in some detail:

He was the second eldest of 6 children of a farming family in England and until 1951 his health record was excellent. He left the farm at the age of 14 to work in industry at Oxford. He remained with the same firm, making slow progress and being moved from one branch to the other.

All his life he had lived quietly in lodgings—a set pattern of



respectability—work, a glass of beer after a heavy dinner, sleep, and a theatre once a week. In 1933 he married his landlady's daughter. He found out in 1940 that for many years she had been unfaithful to him and in 1946 he divorced her.

In 1948 he was sent to Cornwall and for 2 years, whilst under the influence of his immediate superior, a dominant individual, heavy drinking, irregular eating and a guilty sexual relationship with a friend's wife replaced the previous staid pattern of living. In 1951 he moved to South Africa and 2 months after his arrival here, he was found to have diabetes.

He is a placid, quietly spoken, unassertive individual, who has a most likeable appearance and whose intelligence is sufficient for his particular social and working background. He accepts every situation in which he is placed and if he has any resentment he never shows it.

Throughout his life he has been dominated by women. His mother was a strong character who ruled her husband and children and determined their way of life for them. His first wife, who was 10 years younger than he, had no difficulty in managing her life with him and in concealing her extramarital relationship, his apathy and passivity making the whole situation easy. It seems as if he has a constant need to be mothered. Women like him very much and from the time of the break-up of his marriage there have been a succession of relationships. In 1955 he married again and this wife maintains a motherly attitude to him.

Sexually he has always been adequate, except in marriage. His libido has progressively declined and performance has become unsatisfactory, so that when first seen he had been impotent almost from the start of his second marriage. This mirrors to a large extent his previous marital experience. Pre-marital sexuality with both wives was adequate—a sexual relationship in which there is a degree of guilty feeling apparently supplies the impetus for adequate performance.

He related himself very well to the therapy situation, and over a period of 3 weeks with 5 interviews lasting from 45 to 60 minutes each, dealing with his emotional and social life and work situation, he began to feel much better. He lost 15 lb. in weight, the urine soon became sugar-free and insulin could be discarded. This improvement has been maintained, although the hyperglycaemia has persisted in spite of the absence of glycosuria, the last estimation being 264 mg. %.

It was felt that authoritative guidance and encouragement was necessary for this rather apathetic and unaggressive individual. A great deal of environmental manipulation was carried out. Thus he was persuaded to ventilate his grievances to his employer. His working hours were shortened. His lack of libido and performance was discussed and resulted in some improvement.

#### DISCUSSION

No amount of emotional stability in itself will give a diabetic back his ability to produce insulin from his own pancreas, but it will enable him to adjust much more satisfactorily to his life situation. Before the discovery of insulin there were many observations in medical literature on the importance of the influence of life situations on the course of diabetes mellitus. Some 300 years ago Thomas Willis remarked on sweet urine and said that the disease was caused by 'prolonged sorrow'.<sup>1</sup> In 1946 Mersky demonstrated that hyperglycaemia and glycosuria could be brought about in diabetic subjects by stressful interviews.

There has been an increasing body of evidence describing the manner in which psychologic, social and cultural factors influence the incidence, onset and course of the disease.<sup>2</sup>

Harold G. Wolff,<sup>3</sup> describes a situation in which a normal healthy human temporarily develops diabetes, namely starvation. If carbohydrate is fed to a subject after an absence of food for more than 24 hours, the blood sugar rises to hyperglycaemic levels, producing a 'diabetic glucose tolerance' curve and glucose is promptly excreted in the

urine. However, the metabolism soon responds to food and the glycosuria disappears. Hinkle suggests that deprivation of love objects or relationships which are indispensable to the security of the individual, might set up a reaction pattern similar to food deprivation.

In the proper study and evaluation of chronic disease a holistic attitude is necessary and it cannot be fully understood out of the context of daily living and the goals and aspirations of the individual and his culture. Attitudes engendered by cultural pressures become relevant to body function. Diabetes is the end result of an intricate chain of causation in which many factors are involved, not least emotional disturbances and stresses deriving from the particular mode of living.

In early childhood W developed a strong emotional conflict between resentment of his parents and docile submission. There is a history of domination by the mother, with strong ties of affection and dependence. His first marriage was not successful in that his need to be babied was not gratified. His inability to make up his mind led to an unduly long protraction of divorce proceedings with a great deal of emotional distress. The period 1948 to 1950, when his feelings of insecurity led to a slavish imitation of his employer's mode of living, heavy drinking, irregular eating and a great deal of unhappiness was probably the determining factor in the onset of his diabetes.

Factors which have led to an improvement in his emotional life are the cooperation of his present wife, who supplies the necessary motherly care. She is extremely helpful in taking steps to widen the social life and to encourage our recommendations of greater social activity. The development of an interest in bowls, with its friendly social attitude, has given him a much better outlook on life. The resolution of his conflicts in regard to the long hours of his job has led to a much more realistic and friendly attitude to his employer. The acceptance of his sexual disability and our interests in improving matters is a source of satisfaction.

#### SUMMARY

The proposition that threats and symbols of danger and their emotional concomitants have profound repercussions within the organism, is undoubtedly correct. Changes, disruptions and deprivations result from the interaction of humans on each other. Unease in the emotional life cannot be divorced from the soma. Chronic emotional stress must inevitably cause breakdown or neurotic compromise both physically and psychologically. In the case of W it was followed by diabetes, and at least the glycosuria, if not the hyperglycaemia, could be eliminated by a resolution of the conflicts.

The illnesses of man should always be considered in the totality of his existence and never as isolated entities.

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## DIE PROBLEEM VAN HARDHORENDHEID

IZAK A. VAN N. FICK, M.B., CH.B.

Oor-, Neus-, en Keeldepartement, Algemene Hospitaal, Pretoria

Die term 'dowes' word in sekere lande vervang deur die term 'hardhorendes', omdat die opvatting bestaan dat totale doofheid as sodanig nie bestaan nie (Bentzen<sup>1</sup>). Die rede vir hierdie opvatting is dat elke dowe persoon, hetsy deur rehabilitasie of chirurgiese metodes, só gehelp kan word dat hy nie meer totaal doof is nie. 'n Ander rede vir die gebruik van die term is sielkundig van aard. Om iemand as doof te bestempel, wek geen simpatie nie, maar wel 'n gevoel van verwydering, terwyl die gebruik van die term hardhorendheid die pasiënte baie meer aangetrokke tot 'n mens laat voel. In die vroeëre jare is dowe mense selfs in gestigte geplaas omdat gedink is dat hulle swaksinnig is, en hierdie stigma kleef nog steeds aan hulle. Die gehoor is nie alleen een van ons belangrikste senuigorgane nie, maar speel ook die belangrikste rol in die ontwikkeling van ons spraak en ewewig. Verder staan die gehoor in 'n belangrike verband met ons oë, sentrale senuweestelsel en psige.

Die voorkoms van hardhorendheid is baie hoog. In Denemarke (Bentzen<sup>1</sup> en Røjskjær<sup>2</sup>) is bewys dat 10% van alle mense hardhorend is. Dit is ook 'n toestand wat nie sekere persone uitkies bo ander nie. Wie van ons ken nie minstens een belangrike persoon wat hardhorend is nie, bv. 'n minister, 'n onderwyser, 'n geneesheer of 'n predikant. Selfs persone soos Julius Caesar, Martin Luther en Beethoven was gestrem in hul werk vanweë hul gehoorgebrek.<sup>3</sup>

Die oorsake van doofheid kan soos volg opgesom word: (1) Aangebore en huweliks-faktore, (2) siektes, beserings en medisyne gebruik gedurende swangerskap, (3) medisyne, (4) siektetoestande, (5) beserings soos skedelbeserings en werksomstandighede, en (6) vasculêre veranderinge.

### Wat Behoort Gedoen te Word

Die audiologiese program behoort gebaseer te word op maatreëls wat aan die volgende voldoen (Røjskjær<sup>2</sup>): (1) Voorkom die toename van gehoorsiektes (profilakse), (2) behandel die bestaande gehoorsiektes (behandeling), (3) bespaar die gehoorreste, vermy verergering (konservasie), en (4) kompenseer vir die gevolge van chroniese gehoorsiektes (kompensasie).

Indien die oorsake van doofheid in ag geneem word, kan deur voorbehoeding in 'n groot mate gehelp word, bv. voorsorg en advies in gevalle van oorerflike siektes, goeie higiëne gedurende swangerskap, infeksies en toksiese toestande gedurende swangerskap, Rh-bepaling voor geboorte, goeie geboorte-higiëne, bestryding van infeksies gedurende die kinderjare, enting, en, laaste maar nie die minste nie, gereelde audiometriesse ondersoek van alle kinders sodat 'n gehoorgebrek gediagnoseer kan word so vroeg as moontlik. In Skandinawië word kinders op 3-jarige ouderdom ondersoek en minstens 3 keer gedurende hulle skoolloopbaan (Lidén<sup>4</sup>). Dis 'n bekende feit dat 'n kind swak vordering maak indien hy 'n gehoorgebrek het. Roetine-ondersoeke is nodig omdat 'n mens 'n 30db. gebrek moet hê voordat die gebrek baie opvallend is. Alle kinders behoort minstens 3 keer gedurende hulle skoolloopbaan 'n gehoortoets te ondergaan en, indien enige afwyking opgelet word, elke 6 maande. Dit sal voorkom dat kinders in aanpassingsklasse beland of selfs die skool moet verlaat vanweë 'n gehoorgebrek. Selfs die hoogs

intelligente kind sal 'n vertraging ondervind as hy 'n gehoorgebrek het. Dit is nodig dat daar fasiliteite vir behandeling aan sekere skole geskep moet word waarheen hardhorende kinders gestuur kan word sodat hulle tussen normale kinders kan beweeg en nogtans die grootste voordeel uit hul opvoeding kry.

Dit is die plig van elke ouer om toe te sien dat sy kind 'n gehoortoets ondergaan voordat die kind skool toe gaan.

In alle publieke werke waar daar 'n vermeerderde lawaai bestaan, behoort voorsiening gemaak te word om gehoorskade te voorkom. As ons dink aan groot metaalwerke, die boubedryf, markte, telefoonsentrales, lugdiens, e.a., is dit skokkend om te verneem dat daar meestal geen voorsorg getref word om hierdie werkers te beskerm of gereeld te toets nie. Daarby is die kompensasië vir hulle belangrikste senuigorgaan 'n minimum.

Dit is ons doel om beter diens aan die mensdom te lewer en om die pasiënt te beskerm teen enige vorm van uitbuiting, byvoorbeeld 'n gehoorgesering wat hy in sy werk opgedoen het en waarvoor hy geen kompensasië kry nie of ongeskikte apparate wat hy aankoop sonder die aanbeveling van medici.

Die verskaffing van gehoorapparate aan die publiek behoort beheer te word. So dikwels sien ons pasiënte met ondoeltreffende gehoorapparate wat totaal onbewus daarvan is dat hulle gehelp kan word. Die tragiek is dat hierdie mense soms met die apparate loop totdat dit te laat is en dan word wonders van die medici verwag. Die hulp van gehoorapparate is aan ons almal bekend, dog dit moet oordeelkundig gebruik word.

Dit is absoluut nodig dat daar 'n sentrale gehoorsentrum aan die oor-, neus-, en keeldepartement van elke universiteit behoort te wees wat in samewerking met ander departemente soos opvoedkunde, spoorweë, verdediging, arbeid, sowel as skole vir dowes, spraakterapie-afdelings, en ander mediese departemente, hul kragte saamspan om die probleem te beheer en te beveig.

### Wat Bereik kan Word

(a) Deur die rehabilitasie van hierdie pasiënte, wat tot 'n groot mate uit die sosiale lewe gestoot is, word hulle teruggeplaas op 'n sosiale basis.

(b) Dit is bewys in Skandinawië dat die koste wat aangegaan word vir die organisasie van die hardhorendes, van hulle beter belastingbetalers maak, en hierdie vermeerderde belasting betaal weer die koste op die lange duur.

(c) Die bevordering van mense in hul werk word dikwels belemmer deur 'n gehoorgebrek. Selfs indiensneming in 'n sekere werk is soms onmoontlik, en hierdie probleem behoort tot 'n groot mate oorkom te word.

### OPSOMMING

'n Oorsig is gegee van die oorsake van hardhorendheid en van die belang van die gehoor in ons opvoeding en sosiale lewe, soos ondervind in oorsese lande gedurende 'n onlangse besoek aan oor-, neus-, en keelsentrums aldaar.

Die probleem van hardhorendheid bied 'n uitdaging aan elkeen wat werk doen in die belang van die medemens,

insluitende alle medici, opvoedkundiges, elke ouer en alle werkgewers.

Hoe vroeër die toestand van hardhorendheid gediagnoseer word, hoe beter is die kans op 'n goeie resultaat, of op die voorkoming van die gebrek. Die nodige fasiliteite moet geskep word om alle ondersoeke te kan doen in medewerking met die persone of departement wat daarmee gemoeid is.

#### SUMMARY

The causes of defective hearing in the hard of hearing are reviewed and the importance of hearing in education and social life, as experienced by the writer during a recent visit to ear, nose and throat clinics in overseas countries, is stressed.

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### NUTRITION IN PUBLIC HEALTH\*

W. A. ODENDAAL, D.Sc., Pretoria

Health was appropriately defined by the World Health Organization in 1950 as 'A state of complete physical, mental and social well-being'. In 1953 nutrition was spoken of as 'the cornerstone of preventive medicine, the handmaiden of curative medicine and the responsibility of every physician'.<sup>1</sup> The public-health worker, therefore, rightly considers nutrition as the most basic of all our material needs, and the responsibility of man, woman and child.

Appetite cannot any longer be regarded as a reliable guide to our nutritional needs. Brock<sup>2</sup> has maintained that 'the culinary art and the enterprise of food technologists have so transformed the appearance and taste of natural foodstuffs that appetite has lost its path as a guide to health; so public education in health and nutrition is a definite necessity'. The prevalence of gluttony and obesity in many countries is proof of this statement. In all fairness we must, however, add that under present economic conditions, lack of knowledge and proper food supplies, our choice is limited and we are not completely free to pick and choose as our forefathers were. The masses are therefore compelled to seek the advice of those who know.

Many nutritionists are still preoccupied largely with their laboratory experiments and leave it to the public-health worker to mobilize medical, economic, social and allied disciplines to protect and advance the health of the people. This is a great task and demands a vast amount of knowledge over a wide field. It calls for the application in dietary practice and national policy not only of present knowledge but also of new knowledge as it accrues. Daft<sup>3</sup> aptly pointed out that public health practices are not static, but must change with the needs and desires of the people, and with progress in science and technology.

Although much remains to be learnt about the nutritional needs for health and optimal growth at all stages of development, knowledge of human requirements has advanced sufficiently to permit the setting up of guides to be used in planning diets for individuals both normal and sick as well as for population groups.<sup>4 11</sup>

Current information is sufficient to allow almost complete eradication of the deficiency diseases.<sup>12</sup> They will, however, remain a problem in many areas of the world until education, technology and an improved economic situation can implement practical application of such information. Nutritional diagnosis has become more precise and the possibility of labelling nutrients with radio-active elements has made it possible to trace the fate of dietary factors from ingestion through various metabolic pathways to excretion. Such labelled compounds have not only proved of practical value in medical diagnosis and therapeutics, but have also contributed greatly to the understanding of physiological and pathological processes.<sup>13</sup>

Provision for adequate nutrition is recognized as of primary importance for pregnancy, throughout the period of growth, for the maintenance of health in adult life and in the treatment of disease even of non-nutritional origin. The application of proper

The problem of defective hearing presents a challenge to everyone working in the interests of his fellow human beings. All doctors, educationalists, parents and employers are therefore directly concerned with the problem.

The early diagnosis of defective hearing is of the utmost importance if the best results are to be achieved. The necessary facilities for a full investigation of the problem, in cooperation with all departments concerned, must be established.

nutrition is being appreciated in surgical patients in the pre operative and post-operative stages.

Professor Platt issued a warning against the danger of regarding the subject of nutrition as being similar in scope to dietetics and of considering diseases due to malnutrition solely as the result of dietary deficiencies.<sup>14</sup> He approves of Sherman's definition of nutrition<sup>15</sup> as 'the assemblage of the processes in the growth, maintenance and repair of the living body as a whole or of its constituent parts or organs'. Platt furthermore draws attention to the following definition of *disease* given by Hoerr and Oslo:<sup>16</sup> 'The failure of the adaptive mechanisms of an organism to counteract adequately the stimuli or stresses to which it is subjected resulting in a disturbance in function or structure of any part organ or system of the body.'

Selye,<sup>16</sup> in his concept of stress, considers shortage of food among the several environmental factors conditioning the response to a stressor. Dietary disorders may actually become stressors and Platt believes 'the attraction of Selye's concept is that it provides support for associating some pathological changes which appear to be common both to malnutrition and zymotic disease and that it constantly raised the question of the role in these changes of the endocrine glands and their secretions'.

The close interrelationship between nutrition and the endocrines has been recognized. Many women with certain pregnancy and menstrual disorders such as dysmenorrhoea and menorrhagia may bear testimony of this relationship. Robert Williams<sup>17</sup> believes that the era of vitamin discovery is coming to a close and that 'right now the fats and the lipids are having their day'. Furthermore, 'all in all it is clear that we are back dealing with the major components of food rather than the minor ones, which loomed so importantly on the horizon of 1933'.

In public health the appropriate balance of all nutrients in a diet is of vital importance. Today, when most of the essential nutrients have been identified and mainly characterized, the stage has been reached where the mechanism (mode) of action of the nutrients is demanding attention as does the interaction or interrelationship of nutrients—and of nutrients and the endocrines.<sup>18</sup> All the nutrients are involved—proteins with their different amino acids, vitamins, minerals (micro and macro), fats and fatty acids and the carbohydrates. In his classical studies on the amino-acid fortification of maize, Elvehjem *et al.*<sup>19</sup> were amongst the foremost to point out the existence of an imbalance between leucine and isoleucine, and an antagonism between other amino acids in maize.

In Africa our chief concern is still with the underfed and malnourished rather than with the overfed. Kwashiorkor of the infant and pellagra of the adult are still with us. However, with the advancement in industry and economics and in administrative machinery, and with the close collaboration between the national governments and the international health bodies such as WHO, FAO and UNICEF, progress, not only to improve the diet quantitatively but also qualitatively is witnessed.<sup>20 23</sup>

In protein nutrition as well as with vitamins, minerals, fats and carbohydrates, practical diagnostic procedures are urgently required to detect deficiencies, both clinical and subclinical, in

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populations. As to proteins, Howe<sup>24</sup> believes that creatinine output is a much better measure of protein mass than body weight. Platt and Heard<sup>25</sup> maintain that urine has been neglected as a source of information and suggest that the determination of urea nitrogen and ammonia nitrogen as proportions of the total urinary nitrogen offers a simple method of assessing nutritional status with respect to protein. Single morning specimens provide the required information.

#### PREGNANCY

Marjorie Heseltine<sup>26</sup> sounds a warning that some people seem to think we can afford to forget about nutrition programmes for mothers and children and turn our attention entirely to overfed adults and the chronically ill of all ages. The American nation is growing younger faster than it is growing older—during the decade preceding 1956 the population over 65 years of age had increased by 37%, whereas the population under 5 had grown by 55%!

The all-or-none phenomenon, the belief that either the embryo is capable of supplying itself adequately from the mother's tissues or dies in case of failure to do so, does not hold any more.<sup>27</sup> Platt<sup>13</sup> quotes Burke and Stuart as saying in 1952 that there is an increasing amount of evidence 'that the fetus is parasitic on the mother to a degree depending on the mother's nutritional condition when she enters pregnancy as well as on the quality and quantity of her diet during pregnancy', and concludes that 'food shortages are shared by mother and infant and the effects of malnutrition on the mother are reflected in the state of nutrition of the offspring'. More attention is now being paid to the first trimester of pregnancy because this appears to be the critical period during which malnutrition, infection, and ionizing radiations, may cause malnutrition in the foetus.<sup>13</sup>

The suggestion<sup>28</sup> that genes act as enzymes, together with the discoveries that riboflavin and other vitamins form essential constituents of a number of enzymatic systems, lead to the conclusion that either a nutritional deficiency or a defective gene may cause the same congenital abnormality. The same enzymatic system necessary for normal development becomes disturbed.<sup>27</sup>

Platt<sup>13</sup> considers that birth weights and 'perinatal mortality' rate (death rate of infants up to 28 days of age) may be used as indications of the condition of the offspring; 'another important criterion is the vigour of the infant which may determine the infant's power to suck and therefore to survive'. For the condition of the mother, maternal morbidity and mortality rates, which are generally high in communities where there is malnutrition, toxæmias of pregnancy and poor lactation performance, give some indication of the condition of the mother.

In order to prevent overweight during pregnancy, the Dietary Standards Committee in South Africa<sup>10</sup> recommends a reduction in calorie intake of pregnant mothers in contrast to the customary standards. For the last trimester pregnant mothers are divided into sedentary, moderately active and heavy worker categories; only 200, 300 and 400 extra calories are allowed for these three categories respectively.

#### LACTATION AND THE INFANT

The newborn human infant is immature compared with the laboratory animal.<sup>13</sup> Its birth weight is only 5% of its mother's body weight, while the litter of a guinea-pig may be as high as 40% of the weight of the mother.

If one considers that the average milk production at 1 month is about 700 ml. a day, and at 4 months about 1 litre, one can appreciate the drain on the mother's tissue from continued lactation, especially when in an undernourished and malnourished state. Fortunately for the expectant mother, her nutritional requirements often receive special care from the family, but the nursing mother is commonly neglected.

It is generally accepted that the mother's response to a shortage of food is chiefly a reduction in the volume rather than in quality of milk secreted.<sup>13,29</sup> The former is, however, considered to be even more serious than the reduction in quality, because it may diminish by about a quarter or one-third of the normal. In order, therefore, to sustain ample lactation, more nutritious food should be consumed.

#### INTRODUCTION OF SOLID FOODS

Solid foods are being introduced into the infant diet at an increasingly early age. Paediatricians are said to experience con-

siderable pressure on the part of the mothers for the early introduction of solid foods.<sup>30</sup> History relates that until about 1920 solid foods were seldom offered before 1 year of age; by the mid-1930s the fear of solid foods before 1 year had been overcome.<sup>30</sup> Although infants a few weeks of age are able to digest, assimilate and utilize many solid foods made available in a finely divided state it does not prove that they are fully ready for solid foods until a later age.<sup>30</sup> No nutritional advantage or disadvantage has as yet been proved for supplementing adequate milk diets with solid foods in the first 3 or 4 months of life. The potential danger, however, exists that early supplementation of milk diets of infants with solid foods of inferior nutritive value may result in a decreased intake of milk, because of its satiety effect.

Not until it is 3 or 4 months old is the infant capable of voluntarily transferring food from the front of the mouth to the back of the mouth through tongue action. At this stage a change takes place. The infant no longer pushes vigorously with its tongue against a spoon or solid foods placed between the lips. When food is brought to his mouth the lips part and the tongue carries the food to the back of the mouth and swallowing follows. As manifested by dribbling, salivary secretion usually does not make its appearance until the 3rd or 4th month of age. Chewing motions are a later accomplishment—all indicative of nature's plan that a liquid diet should be the type ingested for the first few months of life.

The premature infant also can retain and utilize meat protein as well as milk protein.

As early as 1937 the value of early introduction of strained vegetables and fruits to the infant's diet was recognized, because of their content of vitamins, iron and possibly other factors—and because of the psychological benefits on food habits.<sup>31</sup> Such alleged psychological benefits from early feeding of solid foods must, however, be viewed with scepticism. On the basis of present knowledge it is agreed that no nutritional superiority or psychological benefit results from the introduction of solid foods into the infant's diet before 2½-3 months of age. During the 3rd month iron-containing solid foods should be introduced. The S.A. Dietary Standards Committee recommends a daily allowance of 6 mg. of iron up to 1 year of age. Strained meats supply from 0.23 mg. iron/tablespoon to 0.56 mg. (liver), green and yellow vegetables from 0.05 mg./tablespoon to 0.28 mg. (green beans), while one egg supplies approximately 1.0 mg. of iron.

The Committee furthermore reiterates that the needs of infants are best served on an individual basis. Large rapidly growing infants craving for large quantities of milk, may be satisfied by reasonable concentration of the formula, or by supplementing the diet with cereal or meat at an age earlier than 3 months. Small premature infants may not be considered ready for solid food additions even at 3 months of age. Infants with special problems such as sensitivity to milk merit individual attention. Further controlled observations are needed to determine whether there is justification for special cautioning against the inclusion at an early stage of the more allergenic foods such as wheat and egg white.

#### THE GROWING CHILD

More information is required about satisfactory rates of growth in children. The problem is whether the attainment of large size through very rapid growth either during the growth period or in adult life is in the interests of optimal health. Platt<sup>13</sup> believes that growth-velocity curves, the increments of height or weight per annum plotted against age, may emphasize characteristic features of growth which the environmental age-weight or age-height curves will not show. In females the growth-velocity curves show a peak preceding menarche and with puberty in boys. The peak occurs two or three years earlier in the female than in the male.

From a public-health point of view it is important to remember that among the non-White races in Africa the weanlings and the toddlers—the 1-5 year age group—form the most vulnerable group amongst the stress groups. The child's place in society is not fully recognized yet.

#### ADULTS AND ELDERLY PEOPLE

##### Adults

Much controversy exists about the nutritional requirements of the adult for optimal health. Many able workers urge that

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allowances for adults should be reduced for various nutrients such as proteins, ascorbic acid and calcium, and opinion is unanimous that calories should be reduced to prevent overweight with all its hazards.

Again it is better to err on the safe side and not to rush public-health measures. Some workers not only recommend a reduction in total protein, but also find animal protein superfluous. Recently, however, *Nutrition Reviews*<sup>32</sup> published a reminder not to overlook the concept of the essential amino acid too easily. 'They (results) lend considerable support to the notion that animal proteins are essential for the maintenance of the adult organism as well as for growth, regeneration and synthesis. However, cells of the sedentary adult are certainly involved in some regeneration and synthesis. It is quite possible that the animal proteins (with their balance of essential amino acids) are necessary to support these latter two processes of the adult, whereas they may not be specifically required for cellular maintenance'.

It is common experience in Africa that apparently healthy Bantus have a different serum-protein pattern from that of healthy Europeans. Platt,<sup>13</sup> however, maintains that the pattern for Africans resident in Great Britain tends over years to approximate to that of Europeans. 'This may well be due to freedom from exposure to tropical infections as well perhaps as to nutrition.' He quoted Walker *et al.*<sup>33</sup> in reporting some striking reductions in erythrocyte sedimentation rates in groups of Bantus from widely different areas after they had been working in the mines in Johannesburg and had had access to wholesome and regular food. Walker *et al.* have been 'driven to ascribe the changes directly or indirectly to the consumption of an excellent diet for several months'.

Proposals have been made to reduce the allowances for ascorbic acid, but Erik Uhl,<sup>34</sup> after experimentation with the guinea-pig correlated with clinical findings, falls back on the figure of 75 mg. of ascorbic acid per day.

As to calcium requirements, further work is urgently needed before practical measures can be taken. New X-ray techniques are being developed to diagnose minor losses from bone. Nicolaysen holds that calcium figures in bone analyses must be calculated on the wet and intact bone and not on a dry fat-free basis.<sup>35</sup> Furthermore, in dietary surveys consideration is not always given to calcium acquisitions from drinking water, which may amount to as much as 0.2 mg. or more per day.

#### Elderly People

It is satisfactory to know that a speciality of geriatrics is being developed. As long ago as 1950 Sherman<sup>36</sup> justly advocated that nutritional extensions of the adult life cycle result not in longer periods of senility, but in a longer period of prime.

The normal equilibrium between the anabolic group of hormones—the androsteroids and oestrosteroids—and the catabolic pool such as the 11-oxy corticosteroids most probably becomes impaired in old age, with a predominance of the catabolic effect.<sup>18</sup> Attempts should be made to restore the metabolic equilibrium by means of proper nutrition. Contrary to common beliefs more of the essential nutrients (proteins and certain vitamins and minerals), may be needed in old age. A readjustment may be required in the quantity and quality of food. Calories must be restricted, but care may have to be taken that protein, calcium, iron, and certain B-vitamins and possibly vitamin A, are not consumed in suboptimal amounts. In Germany people above 65 years of age are allowed an extra 0.2 g. of protein per kg. of body weight per day and the ratio of animal protein to plant protein is raised.

Encouraging results have already been obtained from the use of protein supplements in the elderly to arrest osteoporosis and promote recalcification. Cases in which this response has failed may have been due to deficient production of the anabolic group of hormones. Protein may also promote the absorption of calcium.

An FAO study,<sup>8</sup> however, while taking account of the possible impairment of digestion which may occur in old age, argues that the small amount of evidence available at present does not indicate that the protein requirements of the aged are quantitatively different from those of other adults.

For various reasons elderly people are especially subject to undernutrition or malnutrition:<sup>37</sup> (a) Sociological, economic, psychological and mechanical factors, e.g. loss of teeth, restricted finances, loneliness and loss of social contacts, or abnormal prejudice against certain types of food; and (b) physiological and biological factors, e.g. loss of the sensations of taste and

smell, subnormal secretion of digestive juices (especially hydrochloric acid and pepsin), dehydration of tissue, or relative increase of body fat.' The sociological, psychological and economic factors are possibly as important as the physiological and biochemical factors in the development of malnutrition among elderly people. On several occasions I have suggested the establishment of a panel of workers consisting of nutritionists, medical practitioners, nurses, social workers, psychologists, economists and other experts to work out a practical programme to ensure that people in the higher age-groups will remain active and happy citizens of the State.

#### DIETARY FAT

With the widespread interest in cardiovascular disease no present-day discussion of food and nutrition seems complete unless it includes a consideration of fat and its relation to health; the relationship between the diet, serum cholesterol and coronary heart disease has continued to be the subject of considerable attention, and the problems of cardiovascular disease are now a public-health responsibility.

Research is continually adding to our knowledge of fat and fat metabolism; but a great deal more research into the nutritional role of fats and their relation to cardiovascular disease is necessary before any major changes in our dietary habits are to be recommended. In the midst of active research it is difficult and often dangerous to make far-reaching generalizations. No persuasion is needed to convince me of the importance of multiple aetiology in the group of cardiovascular diseases, and I agree with Professor Brock<sup>38</sup> that the situation is still too fluid and uncertain to justify pronouncement by those who administer laws about food production and processing and who control nutrition education.

Population studies, headed by Ancel Keys, seem to indicate that diets high in fat are correlated with higher levels of plasma cholesterol and with increased cardiovascular diseases. Decisive proof of the causal relationship is still lacking. It may be well to remember that fat is a normal constituent of food and the body's utilization of fat as a source of fuel is a normal process. The crux of the problem seems to lie in the amount that is being consumed today and in the ratio between the saturated and the unsaturated components. Possibly also other factors are concerned. The South African Dietary Standards Committee<sup>10</sup> have suggested that the fat level in the diet should preferably be 20-30% of the total calorie intake. For children, adolescents, and possibly very active adults, it should constitute 30-40% of the calories. This intake should also meet the requirements for the essential fatty acids. This is possibly as far as we can go at this stage.

Brock<sup>38</sup> furthermore believes that a case has been made for dietary modifications on the part of those who are at risk—those who have already had a coronary thrombosis or suffer from effort angina, or those who have a strong family history of coronary heart disease and who have either middle-aged or essential hypercholesterolaemia. If 50 g. (about 4 tablespoons) of sunflower or other highly unsaturated oils are substituted for say 75 g. of saturated fat in the diet containing 40-45% of calories from fat, the combined quantitative and qualitative change should be effective in reducing the serum cholesterol while leaving the diet reasonably palatable.

The problem is not too disturbing. Agriculture and the food industry can adapt their production and processing to the best interests of the public if only they know what those interests are.

#### DENTAL CARIES

Dental caries is one of the most prevalent of all pathological conditions which assails the human race.<sup>39</sup> More than 95 out of every 100 persons suffer, or have suffered at some time, from one or more carious teeth.

Teeth are not bones, but rather highly specialized cutaneous appendages, histogenetically modified mucomembranous papillae. This difference apparently allows bone to be constantly decalcified and recalcified whereas enamel and dentine are mineralized for the most part during early life, with only very limited secondary calcification in the grown-up. Drastic metabolic attempts such as hyperparathyroidism (or pregnancy), have been unsuccessful in withdrawing calcium from teeth, as judged by our present-day techniques. In teeth we have to distinguish, therefore, between the growing and the fully formed adult teeth. Until it is disproved I accept the opinion of many workers that the development of

structurally sound teeth is dependent also on proper pre-natal and post-natal nutrition, and that strongly developed sound teeth have a better chance to survive than hypoplastic or hypomineralized teeth.<sup>40</sup>

Radio-isotope tracer studies seem to indicate that enamel is permeable both from the oral cavity and the blood-stream. Studies like these, together with the help of the electron-microscope and the epidemiological approach, may throw new light on the problem.

In the meantime, as a practical measure to combat caries, adequate nutrition for the expectant mother and growing child, and unrefined foods with no over-abundance of 'sticky' sweets and oral hygiene also for the adult are advocated. For fluoridation of public water supplies see Steyn.<sup>41</sup>

#### FOOD PROCESSING AND CHEMICAL ADDITIVES

We realize that we live a complicated existence that does not any longer permit the food practices of our grandfathers. Out of present-day needs have been evolved the processed pre-cooked and packaged foods, the breakfast cereals, the frozen fruit juices, frozen or dehydrated vegetables and other foods, and many other practices providing 'convenience foods' and meals that are quick to prepare and serve. Food technology has, therefore, become an integral part of nutrition and of any nutritional health programme. Its aim is to provide a variety of attractive, palatable and convenient foods to care for nutritional needs at a reasonable cost.

Care, however, must be taken not to destroy existing nutritional qualities in foods, or add chemicals that may do harm. In food processing it is not always the vitamins that are involved but also the amino acids. Total destruction may occur in heat processing, or lysine may be bound by the Maillard reaction in such a way that it becomes biologically inactive, though its inactivity is not revealed by chemical hydrolysis.

Chemical additives in food technology, insecticides and pesticides in agriculture, and other additions have become most important, but call for a constant vigil regarding their safety in public health. The same applies to the use of radiation in the preservation of food, which the immediate future will witness.

Enrichment policies are being investigated at present and will not be discussed in this paper.

#### INFECTION AND DISEASE

The intimate relation between the level of nutrition, especially protein nutrition, and tuberculosis is perhaps better demonstrated than the relation between malnutrition and any other infectious disease. Intestinal infection and possibly parasitic infestation may interfere with the absorption of nutrients and may lead to malnutrition or undernourishment, or certain parasites may cause an abnormal blood loss and raise the nutrient requirements. Many believe that nutritional status will improve if diseases such as malaria and intestinal parasites are eradicated.

Platt<sup>13</sup> states that doses of drugs which can safely be administered to adequately nourished patients may be toxic, or even lethal when administered to the malnourished ones.<sup>13</sup> He further states that chemotherapy alone is unable to secure complete and lasting healing, that the state of nutrition may be decisive on a long-term basis, and that there can be no excuse for ceasing to pursue an active nutritional policy. The stress or catabolic effect of acute medical and surgical conditions is well recognized<sup>18</sup> and special dietary precautions are advised to combat such stress effects.

With proper nutrition the country will save on hospitalization and other medical services.

**Mental Disease.** The mental defects of pellagrins are well known. Mental symptoms develop in 1/3rd to 1/4th of the cases and it has been estimated in Italy 4-10% of pellagrins become permanently insane. The symptoms apart from dementia or psychoses are exceedingly varied.<sup>42</sup> Increasing attention is now also being paid to the large numbers of psychiatric patients and mentally retarded children suffering from signs and symptoms suggestive of nutritional deficiencies.<sup>43-47</sup> Dietary deficiencies are believed to affect man's willingness and capacity for work and to alter his personality. Motivation which is a crucial factor in achievement is particularly readily affected by improper nutrition. Effective nutrition will not only raise the total work output, but probably also efficiency.<sup>48</sup> It seems, therefore, that nutrition has important implications in mental disease and that more work

is needed on mental hygiene.<sup>49</sup> Some hold that in this respect we stand on the threshold of a new era in medicine which ranks in importance with the discovery of antibiotics.<sup>50</sup>

#### NUTRITION EDUCATION

Better means are needed of informing lay people effectively about food and nutrition. Man seems to have lost the ability to choose the correct foods and is therefore dependent on acquired knowledge about food values. Our goal must be education for all people. This cannot be achieved by home economists and dietitians alone. It calls for a concerted effort by all those trained in nutrition and the allied sciences. Nutrition education in schools is needed so that children may grow up knowing the facts about foods and nutrients, and it can be carried through to the university student and the medical student.<sup>3</sup> Our medical clinics and hospitals, urban and rural, can be used effectively for nutrition education. A diet teaching centre, for example, has been started at the Montreal General Hospital. In Central Africa effective nutrition education is being given at clinics in rural areas, where the tendency is not to use visual and hearing approaches only, but also that of the taste. Demonstrations of foods and diets can be accompanied by repeated tasting. Food is prepared in accordance with the cultural patterns of the group and is selected with a real understanding of human behaviour. Especially when dealing with the less sophisticated groups the aid of the anthropologist has become indispensable.

The translating of scientific progress and research into successful public health programmes is not easy. 'Research is frequently regarded as among the highest levels of endeavour, and application and interpretation as being a job any one can do. Either job may be done well or done badly; our concern is for each to be done well, because each is mutually supportive. Progress without research is not possible and research without wise interpretation may be a source of personal satisfaction to the individual investigator, but has no real worth to the society in which we live.'<sup>51</sup>

#### THE FUTURE

Darby<sup>52</sup> believes that in the future scientists will be trained in new fields such as food toxicology, nutritional psychology and nutritional anthropology—new fields which are assuming as definite a form as that of vitamin chemistry or protein nutrition some years back. Yes, we are living in an era of great change, an era of satellites and guided missiles, and we must think of related research problems. There is a call for team work amongst nutritionists, medical practitioners, economists, social workers, anthropologists, agriculturalists, educationists, and others. Our motto, however, remains 'EAT YOUR WAY TO HEALTH', and, to accomplish this, keep to the natural and healthy foods in unrefined form as far as possible and with as wide a variety as possible.

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## OFFICIAL ANNOUNCEMENT : AMPTELIKE AANKONDIGING

### MEDICAL AID SOCIETIES REMOVED FROM THE LIST

The name of the following medical aid society has been removed from the list of approved medical aid societies. The members of this society are, therefore, no longer entitled to the preferential tariff:

Mosenthal's Staff Medical Aid Society, P.O. Box 1,  
Port Elizabeth.

Medical House  
Cape Town  
25 May 1959

L. M. Marchand  
Associate Secretary

### MEDIESE HULPVERENIGINGS VAN DIE LYS GESKRAP

Die naam van die volgende mediese hulpvereniging is van die lys van goedgekeurde mediese hulpverenigings geskrap. Lede van hierdie vereniging is dus nie langer op die voorkeurtarief geregtig nie.

Mosenthal's Staff Medical Aid Society, Posbus 1,  
Port Elizabeth.

Mediese Huis  
Kaapstad  
25 Mei 1959

L. M. Marchand  
Medesekretaris

## PHARMACEUTICAL NEWS : FARMASEUTIESE NUUS

### THE FILM STRIP AS A TEACHING AID IN HOSPITALS

Film strips are being used frequently in hospitals and medical schools to illustrate lectures on a wide range of medical subjects. A film strip consists of a number of pictures called frames on a roll of 35 mm. film (similar to that used in 35 mm. cameras). The film may be black and white, although in recent years colour film strips are more freely available and are preferred.

The strip is placed in a special projector and the frames are projected on a wall or screen by the lecturer who merely turns a knob to change each picture. Usually a written commentary is provided with each strip with a paragraph or comment to be read as each frame is shown. Up to 50 or 60 frames may appear on one roll of film and, depending on the subject, these may illustrate a lecture lasting from 20 minutes to 1 hour or more. If so desired, the lecturer need not make use of the written commentary, but can make his or her own comments without reference to the prepared script.

Projectors are simple in design and easy to operate. They can be plugged into a power or electric light plug, and the less expensive ones, which range from £10 to £30, can be used in the average lecture hall. Usually they are powerful enough to throw a large picture 4 or 5 ft. square without the necessity of blacking out the room completely. They can, of course, also be used to project slides or 35 mm. transparencies.

The advantages of strip projectors over moving film projectors are cost, simplicity of operation, and portability. They can be ready for use in a few minutes and operated by an unskilled person. Moreover, since they weigh only a few pounds they can be easily carried by the lecturer.

A notable advantage of the film strip is that the lecturer can linger as long as he wishes over any particular picture, to give a more detailed comment or to answer questions, etc. In moving films, on the other hand, comment on any particular point usually cannot be made until the end of the film, and important details of the film may be on the screen for only a few seconds. Even if a hospital is fortunate enough to possess a moving film projector, films are so expensive that they can usually only be borrowed, and it is out of the question to build up a permanent library for constant and regular use. Film strips, on the other hand, rarely cost more than 1 or 2 guineas each, and for a relatively modest outlay it is possible to build up a useful library of subjects.

The following are details of a typical film strip from the library

of Messrs. Reckitt and Colman (Africa) Limited, who, as part of their service to hospitals, arrange film strip shows and have available a number of film-strips specially produced for teaching purposes in leading hospitals overseas:

*Some aspects of orthopaedic practice.* Made at the War Memorial Hospital, Scunthorpe, under the supervision of David F. Thomas, F.R.C.S., Senior Consultant Orthopaedic Surgeon, and consisting of 25 colour frames, this film strip is designed to assist the student nurse to learn the basic procedures underlying common orthopaedic practices. An operation showing the removal of the internal cartilage of a knee-joint is depicted, but is not given in detail since an attempt has been made to emphasize the important aspects relevant to a student nurse's requirements. A teaching commentary is provided for the use of the lecturer and this is numbered to correspond with the pictures.

A wide range of strips on medical subjects is available in the UK, and a catalogue of those dealing with health education has recently been compiled by the Central Council for Health Education. Strips can also be obtained on loan or by purchase from many of the information offices of the various High Commissioners or Foreign Embassies in South Africa. The United Kingdom Information Office in Cape Town, for instance, has a library of over 200 strips available for loan, on request. Most of these strips are of general interest, but quite a number relate to health matters and nursing in particular. Anyone contemplating the use of film strips as a teaching aid can be assured, therefore, that there are many sources of interesting subjects in the Union today.

As part of their service to the medical and nursing professions in South Africa Messrs. Reckitt and Colman (Africa) Limited maintain and operate a number of strip projectors and they are always happy to arrange shows in hospitals or at medical meetings. Their own library contains more than 20 medical film strips and details of these will gladly be supplied. Arrangements can also be made for hospitals who desire to have permanent copies of any of the strips in the Reckitt and Colman library to purchase these at a nominal charge.

The Manager, Pharmaceutical Division, Reckitt and Colman (Africa) Limited, P.O. Box 1097, Cape Town, will, at any time, be pleased to give advice and information on the use of this medium for teaching purposes. Enquiries from tutor sisters are particularly welcome, and arrangements can also be made to demonstrate the film strip teaching technique to anyone interested.

## PASSING EVENTS : IN DIE VERBYGAAN

*Victoria Hospital, Wynberg, Cape.* A meeting will be held at the Nurses' Home of this Hospital on Tuesday 16 June at 8.15 p.m. Dr. P. Massey will discuss prolonged labour, and Dr. F. N. Charnock will speak on the indications and methods of induction. All practitioners are cordially invited to attend this meeting.

*Lede word daaraan herinner* dat hulle die Sekretaris van die Mediese Vereniging van Suid-Afrika, Posbus 643, Kaapstad, sowel as die Registrateur van die Suid-Afrikaanse Geneeskundige en Tandheelkundige Raad, Posbus 205, Pretoria, moet verwittig van enige adresverandering. Versuim hiervan beteken dat die *Tydskrif* nie afgelewer kan word nie. Dit het betrekking op lede wat oorsee gaan sowel as dié wat binne die Unie van adres verander.

*Research Forum, University of Cape Town.* A meeting of Research Forum will be held on Tuesday 16 June at 12 noon in the large A-floor lecture theatre, Groote Schuur Hospital, Observatory, Cape. Dr. W. Silber (Department of Surgery) will speak on 'The closing mechanism of the lower end of the oesophagus and oesophageal pressure studies in relation to diseases of this region'. All who are interested are invited to attend this meeting.

*South African Society of Anaesthetists, Cape Western Sub-group.* The next meeting of this Sub-group will be held on Monday 8 June in the small A-floor lecture theatre, Groote Schuur Hospital, Observatory, Cape, at 8.15 p.m. Drs. J. Ozinsky and A. B. Bull will speak on 'Anaesthesia for cardiac surgery involving the use of cardiopulmonary bypass'. All who are interested are invited to attend this meeting.

## NEW PREPARATIONS AND APPLIANCES : NUWE PREPARATE EN TOESTELLE

## TYROMIST

Westdene Products (Pty.) Ltd. announce that Tyromist, manufactured by British Schering, of London, is now available, and supply the following information:

Tyromist is an antibiotic, analgesic spray for the treatment of sore throat. Presented in a plastic atomizer, Tyromist provides a pleasant, safe and more effective form of treatment because the unique spray ensures that the fine mist covers the whole of the inflamed area, including the posterior wall of the pharynx and the tonsillar region. Consequently Tyromist relieves the soreness of the inflamed throat within seconds of application, and its powerful antibacterial action ensures that any infection caused by susceptible organisms is quickly eliminated.

Tyromist is principally indicated for the immediate relief and effective treatment of the common sore throat, laryngitis and allied conditions. It is also of value as a prophylactic measure following tonsillectomy and other surgical procedures of the mouth and throat, and is a useful adjunct to systemic chemotherapy in the treatment of pyrexia or true purulent tonsillitis.

Tyromist is presented in a special plastic atomizer containing 25 ml. (1 fl. oz. approximately) of solution with the following formula: tyrothricin 0.02%, getrimide 0.05%, and amethocaine hydrochloride 0.05%, in a demulcent aqueous vehicle.

Samples and further information may be obtained from the sole South African distributors, Westdene Products (Pty.) Ltd., P.O. Box 7710, Johannesburg and their branches.

## HIGH EFFICIENCY STERILIZERS

Allen and Hanburys Ltd. supply the following information:

During the past few years pressure-steam sterilization procedures have been criticized, and it has been suggested in the medical and lay press that sterilization techniques, coupled in some instances with old, inadequate equipment, have resulted in variable and unsatisfactory standards of efficiency.

In 1957 the Medical Research Council of Great Britain set up a working party to examine the field of 'Sterilization by steam under increased pressure' and their report was published in *The Lancet* (I, 425) of 28 February 1959. In 1958 a report was published by the Nuffield Hospital Trust on 'Present sterilizing practice in six hospitals'.

The Allen and Hanburys High Efficiency Sterilizers on show, for the first time, at the Second International Hospital Equipment and Medical Services Exhibition (Olympia, London, 25-30 May 1959) permits 'the provision of suitable equipment' called for by the General Medical Council working party report. It goes even further, as 'press-button control' governs 4 distinct cycles of sterilization, thus eliminating, to a great degree, the human element.

Another new feature of the Allen and Hanburys High Efficiency Sterilizers is the barometrically compensated vacuum switch which, for the first time, makes it possible to ensure constant steam penetration irrespective of fluctuations in the prevailing barometric pressure; it also eliminates surface air film on gloves and containers.

The inclusion of a time/temperature integrator ensures the maintenance of the correct time/temperature ratio for the cycle selected. It computes the sterilizing exposure time from any incoming steam at a temperature between 250°F and 275°F in relation to the process necessary to effect complete sterilization for the cycle initiated by the 'press-button control'.

*Automation surmounts the human element.* Throughout the chosen sterilization cycle the progress of the cycle is visible and is recorded on a circular chart. A monitoring device gives visual and audible warning of any failure.

The manufacturers of the Allen and Hanburys Efficiency Sterilizers have provided an answer to the challenge to produce the necessary equipment for the elimination of sterilization hazards. Moreover, in doing so, they have designed a range of sterilizers which are virtually foolproof.

## BOOK REVIEWS : BOEKBESPREKINGS

## THE KIDNEY

*The Kidney.* An outline of normal and abnormal structure and function. By H. E. de Wardener, M.B.E., M.D., F.R.C.P. Pp. viii+338. 74 illustrations. 45s. net. London: J. & A. Churchill Ltd. 1958.

Our knowledge of the kidney is constantly being added to. It has been well served in recent years by several notable publications, mostly in the form of conference reports, 'seminars' and symposia, which in the main are highly detailed accounts of selected groups of problems. This volume will prove particularly valuable to the clinician who desires a concise outline of renal structure and function in both health and disease. It is a well balanced, clear account of the subject. There is an excellent list of references at the end of each chapter for those who wish to do further reading. M.M.

## VIROLOGY

*Text-book of Virology for Students and Practitioners of Medicine.* 3rd edition. By A. J. Rhodes, M.D., D.Sc. (Edin.), M.R.C.P. (Lond.), F.R.C.P. (C.). Pp. xv+642. 81 figures. 80s.; \$10.00. London: Baillière, Tindall and Cox Ltd. Baltimore: The Williams & Wilkins Company. 1958.

Virology at the present moment, like many other subjects showing a tremendous burst of growth, seems to be rather terrifying to the general reader—an attitude which is hardly surprising in view of the host of articles of a highly technical nature dealing with one or other aspect of a virus or the disease it produces.

It requires experts with vast experience to collate the substance of this mass of literature so as to make the newer knowledge available to the medical reader in a manner in which he will

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appreciate it. The authors of this text-book have succeeded most admirably in doing just this. The general form of the 3rd edition is similar to that of the 2nd, but there are numerous additions to cover the recent advances that have taken place in this field. It should be clearly stated that this is not a handbook of laboratory techniques but it nevertheless makes a point of indicating the types of laboratory procedure employed in the isolation and identification of viruses to illustrate the characters of the viruses.

This is a most readable account of the most modern conceptions of the aetiology, pathogenesis, epidemiology and control of virus diseases. It is designed not only for the general practitioner, but also for the specialists in infectious diseases, public health, pathology, ophthalmology, dermatology and preventive medicine.

The chapters on influenza and poliomyelitis are excellent. The recently isolated viruses such as those of the Cocksackie, Echo and Adenovirus groups naturally receive a more generous allocation of space, but almost every section has been improved by the addition or rearrangement.

One is often asked by one's colleagues to suggest 'a good book on viruses'. Here it is.

A.K.

### HORMONES FROM ENDOCRINE TUMOURS

*Ciba Foundation Colloquia on Endocrinology. Volume 12. Hormone Production in Endocrine Tumours.* Editors for the Ciba Foundation: G. E. W. Wolstenholme, O.B.E., M.A., M.B., B.Ch. and Maeve O'Connor, B.A. Pp. xii+351. 58 illustrations and cumulative index to volumes 1-12. 48s. net. London: J. & A. Churchill Ltd. 1958.

This is a notable, if rather abstruse, publication that endocrinologists will find informative and interesting. Hormones elaborated by experimentally-produced and naturally-occurring tumours of most of the ductless glands are described in detail. The adrenal has pride of place and, though the clinician would have hoped for more about Cushing's syndrome, proper stress is laid on the comparative uselessness of 17-ketosteroid estimation in this condition (excepting the 3 $\alpha$ - and 3 $\beta$ -17-KS fractionation)—a fact that one would wish wider known. The gonads and thyroid are fully discussed.

What endocrine tumours produce different hormones from normal tissues? Do non-endocrine tumours ever modify the production of hormones by normal ductless glands? Important diagnostic aids lie in the answers to these questions, and these answers are only to be found in the type of work described in this commendable colloquium. It will be welcomed by the 'ivory

tower' worker, the clinical pathologist, and a small circle of 'progressive clinical endocrinologists', though I hope Messrs. Churchill will bind others better than the review copy, which is shedding leaves like an autumn poplar!

G.D.C.

### MEDICAL EMERGENCIES

*Manual of Medical Emergencies.* 3rd edition. By Stuart C. Cullen, M.D. and E. G. Gross, M.D. Pp. 302. 41 figures. Chicago: Year Book Publishers, Inc. 1958.

This book has been through 2 editions and 2 reprints and this is the 3rd edition, which should prove its usefulness to, and demand by the newly qualified doctors working under hospital conditions. One says 'under hospital conditions' for with few exceptions the book is not a first-aid manual and the procedures given are mostly complicated, demanding equipment and treatment usually only possible in hospital.

Points worthy of note and well stressed are the constant need for oxygenization in many, if not most, emergency conditions, the provision of a free airway in the injured unconscious, the merits of the different methods (5) of artificial respiration, and the dos and don'ts in the treatment of shock. A few caricature drawings sprinkled here and there help to bring important points more forcibly to the front.

The chapter on circulatory emergencies seems very helpful. The intravenous administration of morphine, for the reasons there outlined, to cases with coronary thrombosis should receive wider trial, for it is true that 'the adjunct measures of rest, relief of pain and administration of oxygen are paramount in the treatment of cardiac shock'. In these times of over-emphasis on the use of cortisone and ACTH one is inclined to agree that 'in some communities (these preparations have) become almost a panacea for shock', and that 'there rarely is need for these drugs in the treatment of shock'. The authors, however, are careful to add that, where the usual measures as outlined by them seem to be inadequate and 'hypotension, pallor and perspiration are prominent, responses are sluggish and colour is poor', a dramatic improvement may be achieved with intravenous hydrocortisone.

There are good summaries on acute poisoning, local anaesthetic drug reactions, head injuries, and care of the patient in acute and chronic comatose states, among others.

On the whole the book deserves to be read and re-read so that its sound advice may be properly noted and remembered. It should be a useful vade-mecum to many district surgeons. It is well written, well printed and well bound.

G.C.A.v.d.W.

### CORRESPONDENCE : BRIEWERUBRIEK

#### MEDICAL AID SOCIETIES REMOVED FROM LIST

*To the Editor:* Will you please be good enough to publish the following announcement in the *South African Medical Journal*:

'The East Rand Branch of the Medical Association of South Africa has withdrawn its recognition of the Springs Industrial Benefit Society as an approved medical aid society. This will take effect as from 30 June 1959.'

E. Meltzer

East Rand Branch (M.A.S.A.)

Hon. Secretary/Treasurer

P.O. Box 536

Benoni

20 May 1959

#### ASSOCIATION SUBSCRIPTIONS

*To the Editor:* The publication in the *Journal* of the decisions of Federal Council at its recent meeting in regard to the Association's subscription rate and reductions which are to be made in certain specified cases, seems to have caused confusion in the minds of some members.

The position is briefly this:

1. The ordinary subscription payable to the Association's Head Office is £4 4s. per annum. In addition there is an amount payable to the Branch to which the member belongs. This varies from Branch to Branch and depends on the costs of running the Branch.

2. The Federal Council agreed that the Association subscription payable by (a) interns, (b) graduates for two years after

qualifying and (c) retired members over the age of 65 years, should be £2 2s. 0d. per annum; but in terms of By-Law 6 (b) this decision must be confirmed at the next meeting of Council in September. This reduced rate for such members can thus only become applicable from 1 January 1960. In addition, except for interns, there is also payable the amount due to the Branch.

3. It was further agreed that notice of motion be given to amend By-Law 9 (c) which refers to the subscriptions paid by husbands and wives, both being members of the Association. In this case the husband would pay the ordinary subscription, while the wife would be subject to a reduction of £2 2s. 0d. The reduction at present is £1 1s. 0d. As this involves the change of a By-Law, it requires two further meetings of the Council before it becomes final and, unless the Council decides to make it retrospective, it will only come into effect on 1 January 1961. Again the amount payable to the Branch for both husband and wife is also due.

4. While the amount of the subscription payable to, and retained by, the Association's Head Office is fixed by the Federal Council, the amount of the branch subscription, which is collected by the Head Office at the same time, is fixed by the Branch itself. Any concessions which a Branch wishes to make to its members lie within the discretion of the Branch.

A. H. Tonkin  
SecretaryMedical House  
35 Wale Street  
Cape Town  
26 May 1959



### DELAYED DEVELOPMENT OF SPEECH

*To the Editor:* A worried mother who comes to her doctor with her 2-, 3- or even 4-year-old child and asks for advice because her child is either not speaking at all or speaking very poorly, is all too frequently told to go home and not worry; the doctor reassuring her that he has known perfectly normal children who did not speak until they were 6 or 7 years old or even older.

Well-meaning and optimistic doctors often do not realize the untold frustrations these children suffer in their social life, their educational progress, and their powers of thought.

It would be well to stress to the medical profession that a child naturally starts acquiring speech between his 1st and 2nd birthdays and, if this does not happen, the mother is well advised to contact a properly trained and competent speech therapist immediately in order to obtain suggestions on how to treat her child at home, and how to plan a speech programme.

There are, of course, many reasons for delayed onset of speech or faulty development of speech. Of these deafness, hardness of hearing, mental retardation, brain injury, cerebral palsy, aphasia, perceptual abnormalities, and physical and emotional factors are commonest. Each of these conditions varies in its symptomatology from child to child and is often difficult to assess.

It is impossible to discuss remedial treatment in this letter, but it should be stated that a speech defect is a serious handicap, that it can be treated, usually corrected, and often vastly improved, especially when the child is ready to learn to speak, anxious to do so, and young enough to adapt himself to his handicap.

It seems to be the doctor's responsibility once again to make sure that the child is given treatment immediately it is required, and that the mother is not given unrealistic and unsatisfying suggestions about forgetting the problem, which will only send her scurrying to unqualified sources for help which, in all probability, will hamper the child's development and not help him at all.

L. Weiss

Speech Therapist

Department of Speech Therapy  
Pretoria Hospital, Pretoria  
May 1959

### THE KUX OPERATION

*To the Editor:* I do not wish to enter into a discussion with Dr. de Bruin and his partners on the merits of the Kux operation. I do however wish to cross swords with them on the implications and inferences contained in the last paragraph of their letter.<sup>1</sup>

Your contributors have apparently become skilled endothoracic operators after a short visit to Innsbruck. They seem unaware, however, of what is entailed in the formal training of a thoracic surgeon. No properly trained thoracic surgeon would need special instruction to perform the Kux operation, much less require 'to start from scratch' to learn the procedure. I did over a thousand thoracoscopies during my training as a thoracic surgeon. Chest surgeons work within the thoracic cavity as a full-time occupation. The sympathetic trunks and vagus nerves present no mysteries to them and are seen at close quarters on innumerable occasions. In the days of sympathectomy for hypertension, this was the operation which apprentice thoracic surgeons were allowed to do as their first exercises in open chest operations at the thoracic unit at which I trained. We know our way round the chest through a thoracoscope and at open operation, and have no need to undertake a postgraduate course at Innsbruck, or at Petersburg, to enable us to divide the vagus or the sympathetic chain.

I should be very surprised if our Innsbruck trainees have some special knowledge denied to the ordinary thoracic surgeon. Dr. de Bruin and his colleagues may well feel that the Kux operation is an 'extremely delicate' one. No trained thoracic surgeon would so describe it or consider that it requires skill beyond that which he practises daily.

I was relieved to note that all the requirements for an immediate thoracotomy are considered necessary. This equipment should of course always be available at a thoracoscopy. Another requirement is a trained thoracotomist. This little item of equipment seems to have been overlooked.

The anaesthetic technique described is well within the scope of the experienced chest anaesthetists employed by thoracic surgeons. They, too, should not find it necessary to undertake a special course of instruction at Petersburg.

I can assure Dr. de Bruin and his co-authors that the necessary 'knowledge and experience, skill and attention to detail' they practise in the performance of this operation would not be beyond the scope of the ordinary thoracic surgeon, who is entitled to consider that for an intrathoracic procedure, his are 'the right hands and the right circumstances'.

A. I. Lichter

Suite 14, Clarendon Centre  
4 Park Lane  
Parktown, Johannesburg  
20 May 1959

1. Correspondence (1959): S. Afr. Med. J. 33, 388.

### THE CARPAL TUNNEL SYNDROME IN HYPOTHYROIDISM

*To the Editor:* I was most interested to read Mr. M. Singer's account of the carpal tunnel syndrome,<sup>1</sup> where he noted that it occurred in pregnancy. I should like to add that it occurs in another metabolic syndrome, namely hypothyroidism (primary or post-operative). I first saw and treated a case of hypothyroid carpal tunnel syndrome in a classical case of myxoedema in a patient aged 60 years, in a thyroid clinic in the UK, which handled large numbers of thyroid patients, and where the deformity had never been noted before. The response of symptoms and signs of the median nerve to treatment was dramatic, and came on long before the patient felt that she was 'better in herself'. At an informal conference on symptoms and signs in thyroid disease that I attended soon after, I mentioned this case, and was told by a member of a sister thyroid clinic that they had collected no less than 16 cases which they had studied very carefully, and in which they had noticed dramatic improvement to replacement therapy. After this, I began to examine the hands of myxoedematous and post-operative hypothyroid patients more carefully, and was able to find 4 cases in 8 months; all cases were women. Presumably the syndrome is due to localized myxoedema of what Mr. M. Singer calls 'the fibrous strands of the retinaculum which blend with interosseous and transverse carpal ligaments'. I have recently seen another case, and the symptoms and signs are so typical of the other female cases that I have seen that I should like to describe briefly its features:

M.M., aged 32 years, female, was referred for the elucidation of an anaemia. She had a history of having had a non-toxic thyroid gland removed 4 years previously for a 'gland growing backwards'. Her immediate chief complaints were intolerance of cold, stubborn constipation, puffiness of the face 'like a Chinese woman', and leg cramps of 10 months duration. For 6 months she had had profuse menorrhagia, and for 3 months had complained of deadness and numbness at night in both hands, more particularly in the right, and mostly in the middle 3 fingers of the hands, with a feeling 'as if the blood couldn't get to the fingers'. Clinical examination showed that she had indeed hypothyroidism, and there was definite hypo-aesthesia to pin-pricks in the distribution of the median nerve of the right hand. There were no motor signs. The left hand was normal. Blood cholesterol was 300 mg. %. Treatment was started at once, with thyroxine, 0.2 mg. daily, and there was the most dramatic improvement in her hands in that the paraesthesia had disappeared completely within a week of starting therapy. She herself felt normal again within 2 weeks of starting treatment. Her maintenance dose is now 0.1 mg. daily, and she has had no recurrence whatever of her hand symptoms. On examination now there is no evidence of sensory loss in the right hand.

When I first encountered the syndrome, I paid a visit to a large orthopaedic clinic; there the surgeons said that they had never encountered (or, more honestly, never recognized) a case, but one of the registrars had seen it 'somewhere in small print whilst swatting for the Fellowship'. One could hardly imagine any reputable orthopaedic surgeon missing a case of hypothyroidism, but one would like to remind them that such cases of carpal tunnel syndrome may appear at their clinics, which would respond better to thyroxine than to surgery!

G. D. Campbell

1117 Colonial Mutual Buildings  
West Street, Durban  
23 May 1959

1. Singer, M. (1959): S. Afr. Med. J. 33, 415.